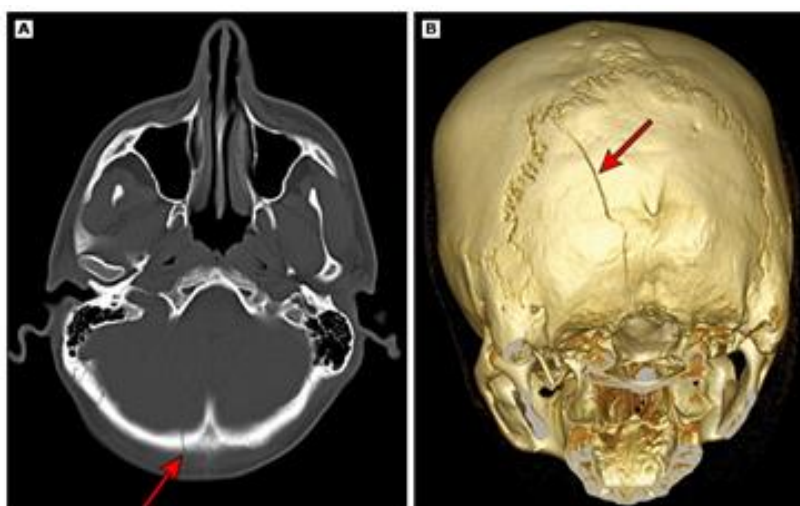


Oral & Maxillofacial Surgery Evidence Update



May 2018
(Bimonthly)

Respecting everyone
Embracing change
Recognising success
Working together
Our hospitals.



Lunchtime Drop-in Sessions

All sessions last one hour

June (12.00-13.00)
20th (Wed) Interpreting Statistics
28th (Thurs) Literature Searching
July (13.00-14.00)
5th (Thu) Critical Appraisal
9th (Mon) Statistics
19th (Thu) Literature Searching
23rd (Mon) Critical Appraisal


Your Outreach Librarian- Jo Hooper

Whatever your information needs, the library is here to help. As your Outreach Librarian I offer **literature searching services** as well as training and guidance in **searching the evidence** and **critical appraisal** – just email me at library@uhbristol.nhs.uk

Outreach: Your Outreach Librarian can help facilitate evidence-based practise for all in the oral and maxillofacial surgery team, as well as assisting with academic study and research. We can help with **literature searching, obtaining journal articles and books**, and setting up individual **evidence update alerts**. We also offer one-to-one or small group training in **literature searching, accessing electronic journals, and critical appraisal**. Get in touch: library@uhbristol.nhs.uk

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Latest Evidence

NICE National Institute for
Health and Care Excellence

[Signal: Dentist service redesign: triage, costs and setting](#)

Source: [NIHR Dissemination Centre](#) - 15 May 2018

[Read Summary](#)

[Calcifying odontogenic cyst, dentinogenic ghost cell tumor and ghost cell odontogenic carcinoma: a systematic review](#)

Source: [PubMed](#) - 08 May 2018 - Publisher: Journal Of Oral Pathology & Medicine : Official Publication Of The International Association Of Oral Pathologists And The American Academy Of Oral Pathology [Read Summary](#)

[Videolaryngoscopy versus direct laryngoscopy for tracheal intubation in neonates](#)

Source: [Cochrane Database of Systematic Reviews](#) - 04 June 2018 [Read Summary](#)



No recent evidence

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[Anesthesia for head and neck surgery](#)

- [Surgical considerations](#)
- [Surgical airway](#)
- [Summary and recommendations](#)

Literature review current through: May 2018. | **This topic last updated:** May 04, 2018.

Recent Database Articles on Oral and Maxillofacial Surgery

Below is a selection of articles on oral and maxillofacial surgery recently added to the healthcare databases, grouped into the following categories:

- Oral surgery
- Bisphosphonate-related osteonecrosis of the jaw
- Maxillofacial
- Cleft lip and palate

If you would like any of the following articles in full text, or if you would like a more focused search on your own topic, then get in touch:

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Oral surgery

Assessing an oral surgery specific protocol for patients on direct oral anticoagulants: a retrospective controlled cohort study

Author(s): Lababidi E.; Breik O.; Savage J.; Engelbrecht H.; Kumar R.; Crossley C.W.

Source: International Journal of Oral and Maxillofacial Surgery; Jul 2018; vol. 47 (no. 7); p. 940-946

Publication Type(s): Article

Abstract:Chronic therapy with the new direct oral anticoagulants (DOACs) poses new challenges for dental practitioners assessing the risk versus benefit of cessation versus non-cessation of anticoagulant therapy for dentoalveolar procedures. A retrospective controlled cohort study was designed to evaluate a non-cessation protocol for patients taking DOACs in the setting of dental extractions. A records review covering the period 1 January 2016 to 31 December 2016 identified 43 patients on DOAC therapy; 53 dentoalveolar procedures were performed under local anaesthesia, of which 15 included varying degrees of peri-procedural cessation. A control group of 50 patients on uninterrupted warfarin therapy undergoing 59 dentoalveolar procedures was identified. The incidence, severity, and timing of bleeding events were recorded for each group. Four (10.5%) minor bleeding events were recorded in the non-cessation DOAC group and nine (15.3%) minor bleeding events in the warfarin group. No bleeding events were recorded in the DOAC cessation group. Comparison of the incidence of bleeding events between the non-cessation DOAC group and the warfarin group showed no statistically significant difference (odds ratio 0.65, P = 0.56). Within the limitations of this study, dental extractions in the context of continuing DOAC therapy can be performed safely provided extra local haemostatic measures are applied. Copyright © 2018 International Association of Oral and Maxillofacial Surgeons

Postoperative bleeding risk of direct oral anticoagulants after oral surgery procedures: a systematic review and meta-analysis

Author(s): Bensi C.; Belli S.; Lomurno G.; Paradiso D.

Source: International Journal of Oral and Maxillofacial Surgery; Jul 2018; vol. 47 (no. 7); p. 923-932

Publication Type(s): Review

Abstract: Direct oral anticoagulants (dabigatran, rivaroxaban, apixaban and edoxaban; DOACs) have been introduced to improve safety and superior therapeutic value compared to their predecessors such as warfarin or enoxaparin. The aim of this systematic review and meta-analysis was to assess the postoperative bleeding risk of DOACs during oral surgery procedures. Systematic searches were performed in electronic databases including PubMed, Scopus, Web of Science and Cochrane Library. Thirteen studies were included in the qualitative synthesis: two retrospective case-control studies, five prospective case-control studies, three cross-sectional studies, two case series and a case report; while only six studies were statistically analysed. The risk ratio of postoperative bleeding in DOACs patients was significantly greater than in healthy patients (3.04; 95% confidence interval (CI) = 1.31-7.04). This is especially true for rivaroxaban (4.13; 95% CI = 1.25-13.69), and less so for dabigatran which presented a risk ratio similar to that of healthy patients (1.00; 95% CI = 0.21-4.82). However, further research is required to support these results. Both apixaban and edoxaban were excluded from statistical analysis due to the lack of clinical studies. Copyright © 2018 International Association of Oral and Maxillofacial Surgeons

The retromolar canals and foramina: radiographic observation and application to oral surgery

Author(s): Kikuta S.; Iwanaga J.; Nakamura K.; Hino K.; Nakamura M.; Kusukawa J.

Source: Surgical and Radiologic Anatomy; Jun 2018; vol. 40 (no. 6); p. 647-652

Publication Type(s): Article

Abstract: Purpose: The retromolar canal (RMC) and foramen (RMF) are anatomic variants in the retromolar area of the mandible. The purpose of this study was to clarify the relationship between the RMC and RMF and related complications, and to reveal how the RMC could impact the mandibular anatomy using cone-beam computed tomography (CBCT) and panoramic images (PAN). Materials and methods: CBCT and PAN images of 50 patients were retrospectively analyzed to investigate the morphology of the RMC and RMF, and their impact on impacted third molar surgery and orthognathic surgery. Results: In PAN images, neither the RMC nor RMF was detected. In CBCT images, the RMCs were detected in 26% (13/50) of the patients. A double RMC was detected on one side of one patient. The diameter of the RMC ranged from 0.8 to 2.9 mm (mean; 1.5 +/- 0.6 mm), and the RMF ranged from 0.6 to 2.3 mm (mean; 1.1 +/- 0.5 mm). No patients experienced unexpected bleeding. Unilateral postoperative hypoesthesia of the buccal gingiva in the molar region was reported in 6.7% of patients with the RMC. Conclusions: Hypoesthesia of the buccal gingiva in the lower molar region may be the main complication when the RMC is damaged. Copyright © 2018, Springer-Verlag France SAS, part of Springer Nature.

Treatment modalities and risk factors associated with refractory neurosensory disturbances of the inferior alveolar nerve following oral surgery: a multicentre retrospective study

Author(s): Hasegawa T.; Akashi M.; Amano R.; Komori T.; Yamada S.I.; Kurita H.; Ueda N.; Kirita T

Source: International Journal of Oral and Maxillofacial Surgery; Jun 2018; vol. 47 (no. 6); p. 794-801

Publication Type(s): Article

Abstract: Little research has been conducted into hypoesthesia, and no studies have elucidated the risk factors for refractory hypoesthesia and compared treatment modalities. The purpose of this multicentre retrospective cohort study was to investigate the relationships between various risk factors, treatment modalities, and refractory hypoesthesia. Risk factors for refractory hypoesthesia after oral surgery were evaluated using univariate and multivariate analysis. To minimize the selection bias associated with a retrospective data analysis, a propensity score analysis was

performed between the medication and non-medication groups (65 sites in each group). Moderate or severe hypoesthesia (odds ratio 13.42) and no or late administration of ATP/vitamin B12 (odds ratio 2.28) were significantly associated with refractory hypoesthesia. In the propensity score analysis, the incidence rate of refractory hypoesthesia in the medication group was lower than that in the non-medication group ($P < 0.001$). This study demonstrated the multivariate relationships between various risk factors, treatment modalities, and refractory hypoesthesia. Moderate or severe hypoesthesia and no or late administration of ATP/vitamin B12 were significantly associated with refractory hypoesthesia. Therefore, clinicians should consider these risk factors and initiate early oral administration of ATP/vitamin B12 in cases of hypoesthesia. Copyright © 2017 International Association of Oral and Maxillofacial Surgeons

Prevalence of neuropathic pain and sensory alterations after dental implant placement in a university-based oral surgery department: A retrospective cohort study.

Author(s): Vázquez-Delgado, Eduardo; Viaplana-Gutiérrez, Marta; Figueiredo, Rui; Renton, Tara

Source: Gerodontology; Jun 2018; vol. 35 (no. 2); p. 117-122

Publication Type(s): Journal Article

Abstract:OBJECTIVE To determine the prevalence and the clinical features of patients with neuropathic pain and sensory alterations after dental implant placement. BACKGROUND Literature is very scarce concerning the prevalence of neuropathic pain after dental implant placement. PATIENTS AND METHODS A retrospective cohort study was made in patients submitted to dental implant placement in the Dental Hospital of the University of Barcelona. A descriptive analysis of the data was made, and the 95% confidence intervals (95% CI) were calculated for the prevalences. RESULT The study sample was composed of 1156 subjects of whom, 1012 patients (3743 dental implants) met the study inclusion criteria. Four hundred and seventeen patients (41.2%) were male and 595 (58.8%) were female, with a mean age of 60.7 years (range 16-90 years). Three patients were diagnosed as having painful post-traumatic trigeminal neuropathy (PPTN), which corresponds to a prevalence of 0.3% (95% CI: 0%-0.6%). Additionally, 5 patients (0.5%; 95% CI: 0%-1.07%) presented trigeminal neuropathy without pain (TNWP). The combined prevalence of both disorders was 0.8% (95% CI: 0.02%-1.3%). All patients with PPTN and TNWP were 60 years old or older, with a total combined prevalence of 1.48% (95% CI: 0.46%-2.5%) in this age group. Additionally, the prevalence in this age group for women was 1.85% (95% CI: 0.38%-3.31%). CONCLUSIONS Neuropathic pain after dental implant placement is very infrequent (0.3%) in a University Oral Surgery department. However, the presence of trigeminal neuropathies can be slightly higher and can affect up to 0.5% of patients. Older female patients seem to be more prone to this rare and disabling complication.

What is the benefit of using amniotic membrane in oral surgery? A comprehensive review of clinical studies.

Author(s): Fénelon, M; Catros, S; Fricain, J C

Source: Clinical oral investigations; Jun 2018; vol. 22 (no. 5); p. 1881-1891

Publication Type(s): Journal Article Review

Abstract:OBJECTIVE Since its first use for the reconstruction of tissue defects in the oral cavity in 1985, human amniotic membrane (hAM) has been widely studied in the field of oral surgery. Despite the growing number of publications in this field, there is no systematic review or meta-analysis concerning its clinical applications, outcome assessments, and relevance in oral surgery. The aim of this review is to provide a thorough understanding of the potential use of hAM for soft and hard tissue reconstruction in the oral cavity. MATERIALS AND METHODS A systematic electronic and a manual literature search of the MEDLINE-PubMed database and Scopus database was completed.

Patient, Intervention, Comparison and Outcomes (PICO) technique was used to select the relevant articles to meet the objective. Studies using hAM for oral reconstruction, and conducted on human subjects, were included in this survey. RESULTS A total of 17 articles were analyzed. Five areas of interest were identified as potential clinical application: periodontal surgery, cleft palate and tumor reconstruction, prosthodontics and peri-implant surgery. Overall, periodontal surgery was the only discipline to assess the efficacy of hAM with randomized clinical trials. The wide variability of preservation methods of hAM and the lack of objective measurements were observed in this study. CONCLUSION hAM is already used in the field of oral surgery. Despite this, there is weak clinical evidence demonstrating convincingly the benefit of hAM in this area compared to standard surgery. CLINICAL RELEVANCE Several studies now suggest the interest of hAM for periodontal tissue repair. Due to its biological and mechanical properties, hAM seems to be a promising treatment for wound healing in various areas of oral reconstruction. However, further randomized clinical trials are needed to confirm these preliminary results.

Management of an Internal Carotid Artery Injury Caused by a Displaced Titanium Plate With a Combination of Interventional Vascular Radiology and Surgery.

Author(s): Shimizu, Yoshitaka; Okazaki, Takahito; Hamana, Tomoaki; Irifune, Masahiro

Source: Journal of Oral & Maxillofacial Surgery (02782391); Jun 2018; vol. 76 (no. 6); p. 1377.e1

Publication Type(s): Academic Journal

Abstract: Treatment of pseudoaneurysms in the internal carotid artery (ICA) is associated with a high risk of cerebral infarction; therefore, vessel ligation for hemostasis must be avoided. A 66-year-old man had intraoral hemorrhaging. At the time of the initial examination, computed tomography angiography showed jaw plate displacement near the ICA. A more detailed image was obtained using digital-subtraction angiography. After evaluation of the image, a pseudoaneurysm was diagnosed. Six days later, there were concerns about aspiration and airway obstruction; therefore, tracheostomy was performed. Interventional vascular radiology (IVR) and surgery were planned to facilitate complete recovery, removal of the jaw plate, and repair of the pseudoaneurysm. Before surgery, it was confirmed that it would be possible to block blood flow for approximately 20 minutes. Surgery was performed with the patient under general anesthesia. Before plate removal, cardiovascular surgeons exposed the left large saphenous vein and prepared it so that it could be used to patch the vascular wall defect. A balloon type of embolic protection device was placed so that it could be inflated at any time after plate removal via oral surgery. The pseudoaneurysm was found directly under the plate; however, it had adhered to the scar tissue. As removal progressed, hemorrhaging occurred. To achieve hemostasis, the balloon embolic protection device was inflated. The pseudoaneurysm was removed, and a red thrombus was aspirated. On postoperative day 41, bleeding reoccurred. Two days later, embolization using a platinum coil and stent placement were performed through IVR monotherapy. Postoperative progress was favorable, and the patient was discharged 83 days after treatment without neurologic sequelae. ICA pseudoaneurysms located near the skull base are risky and challenging to repair. However, for traumatic aneurysms such as the one in this case, a combination of IVR therapy and surgery is useful for controlling intraoperative hemorrhage.

Microbial accumulation on different suture materials following oral surgery: a randomized controlled study.

Author(s): Asher, Ran; Chacartchi, Tali; Tandlich, Moshik; Shapira, Lior; Polak, David

Source: Clinical oral investigations; May 2018

Publication Type(s): Journal Article

Abstract:BACKGROUNDThe aim of the study was to compare bacterial accumulation on different suture materials following oral surgery.METHODSPatients scheduled for implant or periodontal surgery were included in the study. Upon flap closure, four different sutures were placed in a randomized sequence-silk, coated polyglactin, nylon, and polyester. Ten days following surgery, the sutures were removed and incubated in aerobic as well as anaerobic conditions for 7 days and colony-forming units (CFUs) were calculated. Association between bacterial accumulation and periodontal diagnosis, type of surgery, and antibiotic treatment were also tested.RESULTSAll sutures in all patients were found to contain bacteria. Overall, nylon sutures showed significantly lower CFU levels compared to silk, coated polyglactin, and polyester sutures. The type of surgery (implant vs. periodontal surgery) did not significantly influence bacterial accumulation. Also, periodontal diagnosis had little impact on CFU counts. Interestingly, post-surgical antibiotic treatment also had only a minor effect on bacterial accumulation on the various sutures.DISCUSSIONThe results indicate that the monofilamentous nylon sutures showed less microbial accumulation than the other tested materials that were all braided. This effect may be due to material qualities as well as suture macrostructure. Type of surgery, periodontal diagnosis, and antibiotic consumption have little effect on bacterial accumulation of sutures.CLINICAL RELEVANCEThe study provides the microbial profile of commonly used sutures and may assist in suture selection during clinical procedures.

Anesthetic Pump Techniques Versus the Intermittent Bolus: What the Oral Surgeon Needs to Know.

Author(s): Robert, Richard C; Patel, Chirag M

Source: Oral and maxillofacial surgery clinics of North America; May 2018; vol. 30 (no. 2); p. 227-237

Publication Type(s): Journal Article Review

Abstract:The most popular agents in use for office-based anesthesia are propofol, ketamine, and remifentanyl, which have the desirable properties of rapid onset and short duration of action. A useful parameter in assessing these agents is the context-sensitive half-time. These anesthetic agents demonstrate relatively low, flat plots compared with older agents. For delivery of intravenous anesthetics, oral and maxillofacial surgeons have relied small incremental boluses with great success. However, relatively simple syringe infusion pumps can provide an even "smoother" anesthetic. This article familiarizes oral and maxillofacial surgeons with the advantages of infusion pumps and provides examples of their use.

Airway Management for the Oral Surgery Patient.

Author(s): Schwartz, Allan

Source: Oral and maxillofacial surgery clinics of North America; May 2018; vol. 30 (no. 2); p. 207-226

Publication Type(s): Journal Article Review

Abstract:This article discusses anesthesia assessment concepts related to airway evaluation and airway maintenance for safe and reliable selection of either open system (entrainment of room air) or closed system (no entrainment of room air) airway devices, which can be used during office-based oral surgical procedures, depending on the needs of a patient. Dental facial and oral structures are integral to an anesthetist's preoperative patient evaluation prior to surgery. The preoperative medical history and physical examination as well as the nature of the oral surgical procedure affect the selection of a proper and safe airway device.

Oral Surgery Patient Safety Concepts in Anesthesia.

Author(s): Robert, Richard C; Patel, Chirag M

Source: Oral and maxillofacial surgery clinics of North America; May 2018; vol. 30 (no. 2); p. 183-193

Publication Type(s): Journal Article Review

Abstract:An effective office emergency preparedness plan for the oral and maxillofacial surgery office can be developed through the use of well-designed checklists, cognitive aids, and regularly scheduled in situ simulations with debriefings. In order to achieve this goal, the hierarchical culture of medicine and dentistry must be overcome, and an inclusive team concept embraced by all members of the staff. Technologic advancements in office automation now make it possible to create interactive cognitive aids. These enhance office emergency training and provide a means for more rapid retrieval of essential information and guidance during both simulations and a real crisis.

Preoperative Evaluation and Patient Selection for Office-Based Oral Surgery Anesthesia.

Author(s): Lieblich, Stuart

Source: Oral and maxillofacial surgery clinics of North America; May 2018; vol. 30 (no. 2); p. 137-144

Publication Type(s): Journal Article Review

Abstract:Provision of an outpatient anesthetic requires careful review of the patient's medical history along with salient aspects of the physical examination. The oral and maxillofacial surgeon may need to consult with the patient's medical providers to gain an understanding of the patient's potential risks for an adverse event. This article reviews key aspects of the patient evaluation so that an informed determination of suitability for an office anesthetic can be made.

Bacterial endocarditis linked to an oral surgery practice.

Author(s): Palenik, Charles John

Source: Dental Update; May 2018; vol. 45 (no. 5); p. 468-469

Publication Type(s): Academic Journal

Bisphosphonate-related osteonecrosis of the jaw

Changes in epidemiological characteristics of patients diagnosed with medication related osteonecrosis of the jaw (MRONJ): The Sheba medical center experience of the past fifteen years

Author(s): Whitefield S.; Friedlander-Barenboim S.; Yarom N.; Sorel Lazarovici T.; Yahalom R.

Source: Supportive Care in Cancer; 2018; vol. 26 (no. 2)

Publication Type(s): Conference Abstract

Abstract:Introduction MRONJ is affecting a dynamic population of patients, who received medication for osteoporosis and oncology treatment, the demographics are changing due to fluidity in treatment protocols. A change that the relevant health care givers need to be constantly up to date with. Objectives The aim of this study is to track the development of the epidemiological characteristics in the various patient populations diagnosed with MRONJ at the Sheba Medical Center. Methods The files of patients diagnosed with MRONJ from 2002-2016 were retrieved. MRONJ was diagnosed according to AAOMS diagnostic criteria. Data on demographics, medical background, type and duration of drug use and triggering events at presentation was collected. Results The study included 432 patients, 327 females (76%) and 105 males (24%). 63% of patients were in the 60-79 year age bracket. There was a sharp increase in cases between 2008-2009, followed by a steady increase 2009-2012, and a slight decrease 2012-2016. A decrease in the proportion of multiple myeloma patients and an increase in proportion of patients with bone metastases of solid tumors, presenting with MRONJ has been observed in the past few years. In

addition, an increase in proportion of cases in osteoporosis patients compared with oncology patients is evident. Conclusions As a result of changes in drug and treatment protocols and increased awareness of oncology care givers, including referral and consultation with specialists in Oral Medicine, there has been a change in the demographics and presentation of the disease.

Medication-related osteonecrosis of Jaw (ONJ) in cancer patients receiving bisphosphonates or denosumab: time trends among 557 cases of a cancer network (rete oncologica) database

Author(s): Fusco V.; Cabras M.; Gambino A.; Bertetto O.

Source: Supportive Care in Cancer; 2018; vol. 26 (no. 2)

Publication Type(s): Conference Abstract

Abstract:Introduction As an almost unique experience, since 2005 a multidisciplinary study group collected data of cases of Osteonecrosis of Jaws (ONJ) in 221 cancer patients treated with Bisphosphonates (BP) observed in oncology and hematology centers of a regional network (Piemonte - Valle d'Aosta), with yearly incidence reduced from 60 (max on year 2006) to 21 cases (on 2008) (Fusco et al, ISRN Oncology 2013) Objectives Update of yearly incidence after 2008. Methods We asked for ONJ cases observed between 2009 and April 2016 from the same medical oncology, haematology, and oral care centers. Results We received data of further 336 cases in cancer patients: 66% were female and 34% male; primary neoplasm was : breast cancer 150 (45%), myeloma 70 (21%), prostate cancer 70 (21%), lung 18 (5%), renal cell 10 (3%), and other types of cancer or not specified 18 (5%). The median number of cases per year was 44 (range 39-53) in years 2009-2015. Conclusions Preliminary data show an unexpected new increase of ONJ cases per year in spite of measures prescribed to reduce the ONJ risk (dental visit and oral care before antiresorptive treatment). Several possible reasons could be hypothesized : introduction of denosumab in bone metastatic patients; larger introduction of new agents (other than BP and denosumab) potentially inducing ONJ, and higher risk from antiseptorptive plus antiangiogenic drugs; longer survival of some cancer patient subsets (ie, lung and renal cell cancer); etc. The full collection of clinical data is warranted to explore these suggestions. (Figure presented).

Medication-related osteonecrosis of jaw(ONJ) in cancer patients: comparison of stage according to American (AAOMS) and Italian (SIPMO-SICMF) staging systems in 58 patients

Author(s): Fusco V.; De Martino I.; Alessio M.; Numico G.; Fasciolo A.; Nicolotti M.; Benzi L.;

Source: Supportive Care in Cancer; 2018; vol. 26 (no. 2)

Publication Type(s): Conference Abstract

Abstract:Introduction Controversies exist among the ONJ definition (and staging system) of the American Association Oral Maxillofacial Surgery (AAOMS) task force, based on clinical features (mainly bone exposure), and the Italian proposal, supported by the Italian Societies of Oral Medicine (SIPMO) and Maxillofacial Surgery (SICMF), implying adoption of imaging tools (mainly Computed Tomography, CT) together with clinical features (Bedogni et al, Oral Disease 2012). Objectives To compare the stage of ONJ cases at the first observation time in patients receiving antiresorptive therapy (bisphosphonates, denosumab) for malignant diseases, according to two different staging systems. Methods We reviewed cancer and myeloma patients with signs of ONJ after antiresorptives. Results We collected data about 58 patients. The AAOMS stage was 0/I/II/III respectively in 23/10/22/3 cases. The SIPMO-SICMF stage was I (alveolar bone)/ II (extralveolar bone) /III (complicated) respectively in 17/38/ 3 cases. The 23 AAOMS stage 0 cases (signs/symptoms without bone exposure) were reclassified as stage I(8) or II(15) respectively, according to the Italian system. Conclusions There is no unique ONJ definition and staging system , even if the AAOMS one is mostly reported. In our hands, in ONJ cases in cancer patients the AAOMS definition and staging system are insufficient, exposing patients to delayed diagnosis (and potentially

inadequate treatment). It would be advisable to establish the diagnosis not only on the basis of the clinical data but also on the findings of the CT scan, since the latter technique offers greater information about extent and severity of the disease.

Characteristics of osteonecrosis of the jaw (MRONJ) in cancer patients receiving antiresorptive and/or targeted agents

Author(s): Papadopoulou E.; Nicolatou-Galitis O.; Kouri M.; Vardas E.; Demiri M.; Tryfonopoulos D

Source: Supportive Care in Cancer; 2018; vol. 26 (no. 2)

Publication Type(s): Conference Abstract

Abstract: Introduction MRONJ is an uncommon complication associated with antiresorptive and/or targeted agents. Objectives To present the characteristics of MRONJ in our Clinic, 2015- 2017. Methods Two-hundred-forty-three cancer patients were evaluated. Underlying main diagnoses were breast cancer (44.9%), multiple myeloma (22.6%), prostate cancer (11.5%). One-hundred-fifty-four patients received antiresorptives alone (63.4%), or combined with targeted agents (42, 17.3%). Nineteen received targeted agents alone (7.8%). Results Osteonecrosis was diagnosed in 76 patients. Mandible was affected in 43/ 76 cases (56.6%), maxilla in 20/76 (26.3%) and both jaws in 13/76 (17.1%). Osteonecrosis was exposed in 54 cases (71.1%) and nonexposed in 22 (28.9%). Osteonecrosis was related with antiresorptives in 57 cases (75%), with antiresorptives and targeted agents in 18 (23.7%) and with targeted agents alone one (1.3%). Dental extraction preceded osteonecrosis in 29 patients (38.2%), followed by denture trauma (14/76, 18.4%). Painful, mobile tooth was the reason for extraction in 21 patients (27.6%), while self-tooth exfoliation was reported in 10 (13.2%). Patients were managed with antibiotics and ozone. Six patients (10.5%) healed, 25 (43.9%) are stable and 19 (33.3%) remain on intermittent antibiotics. ONJ worsened in 7 (12.3%). 167 patients were referred for MRONJ prevention; prior to (28/167, 16.8%) and after the initiation of medications (139/167, 83.2%). Dental extractions were performed in 19 patients receiving medication; 13 (68.4%) due to pain and/or tooth mobility. All healed. Conclusions ONJ group: Periodontal disease/infection (painful mobile teeth/ self-exfoliation), preceded extraction and ONJ in most cases (40.8%), supporting its association with ONJ. Prevention group: ONJ risk following extraction performed by an expert clinic was limited.

New method of alloplastic reconstruction of the mandible after subtotal mandibulectomy for medication-related osteonecrosis of the jaw

Author(s): Brauer C.; Lauer G.; Leonhardt H.

Source: British Journal of Oral and Maxillofacial Surgery; 2018

Publication Type(s): Article In Press

Double-layer closure techniques after bone surgery of medication-related osteonecrosis of the jaw - A single center cohort study

Author(s): Ristow O.; Ruckschlos T.; Bodem J.; Berger M.; Bodem E.; Kargus S.; Engel M.

Source: Journal of Cranio-Maxillofacial Surgery; 2018

Publication Type(s): Article In Press

Abstract: Introduction: Mucosal wound closure plays a key role after surgery of manifested medication-related osteonecrosis of the jaw (MRONJ). Additional soft tissue layers promise better vascularization and mechanical stability. The objectives of this study were to examine success rates of double-layer closure techniques in MRONJ patients, namely the mylohyoideus muscle flap (MMF) for the lower jaw and the pedicled buccal fat flap (BFF) for the upper jaw. Materials and methods:

We designed and implemented a retrospective cohort study and enrolled a sample of patients diagnosed with MRONJ that were treated between 2015 and 2017 with either the MMF or the BFF after removal of the necrotic bone area. Success was assessed as the maintenance of full mucosal coverage without signs of residual infection at (T0) four weeks (T1), four months (T2), and eight months (T3) after operation. The occurrence of side effects was evaluated. Results: A total of 87 (MMF n = 57; BFF n = 30) patients with 104 MRONJ (MMF 68 =; BFF n = 36) lesions were included. At the time of the last follow-up, 88.0% (44 of 50) of patients in the MMF group and 93.1% (27 of 29) of patients in the BFF group showed mucosal integrity. No serious side effects were reported. Overall treatment of earlier lesions (stage I and II) showed a better outcome than more severe necrosis (stage III). Conclusion: Double-layer closure techniques after surgery in MRONJ patients provide a mechanically stable, well-vascularized covering of the bone defect and should be considered as an option in the standard protocol for all degrees of severity of the disease. Copyright © 2018 European Association for Cranio-Maxillo-Facial Surgery

Prevalence of bisphosphonate-related osteonecrosis of the jaw-like lesions is increased in a chemotherapeutic dose-dependent manner in mice

Author(s): Kuroshima S.; Sasaki M.; Nakajima K.; Tamaki S.; Hayano H.; Sawase T.

Source: Bone; Jul 2018; vol. 112 ; p. 177-186

Publication Type(s): Article

Abstract: Bisphosphonate-related osteonecrosis of the jaw (BRONJ) worsens oral health-related quality of life. Most BRONJ occurs in multiple myeloma or metastatic breast cancer patients treated with bisphosphonate/chemotherapeutic combination therapies. Cyclophosphamide (CY), an alkylating chemotherapeutic drug, is used to treat multiple myeloma, although its use has been recently reduced. The aim of this study was to clarify the effects of CY dose on tooth extraction socket healing when CY is used with or without bisphosphonate in mice. Low-dose CY (50 mg/kg; CY-L), moderate-dose CY (100 mg/kg; CY-M), high-dose CY (150 mg/kg; CY-H), and bisphosphonate [Zometa (ZA): 0.05 mg/kg] were administered for 7 weeks. Each dose of CY and ZA in combination was also administered for 7 weeks. Both maxillary first molars were extracted at 3 weeks after the initiation of drug administration. Euthanasia was performed at 4 weeks post-extraction. Gross wound healing, microcomputed tomography analysis, histomorphometry, and immunohistochemistry were used to quantitatively evaluate osseous and soft tissue wound healing of tooth extraction sockets. ZA monotherapy induced no BRONJ-like lesions in mice. CY monotherapy rarely induced open wounds, though delayed osseous wound healing occurred in a CY dose-dependent manner. In contrast, CY/ZA combination therapy prevalently induced BRONJ-like lesions with compromised osseous and soft tissue healing in a CY dose-dependent manner. Interestingly, anti-angiogenesis was noted regardless of CY dose and ZA administration, even though only CY-M/ZA and CY-H/ZA combination therapies induced BRONJ-like lesions. Our findings suggest that high-dose CY may be associated with the development of BRONJ following tooth extraction only when CY is used together with ZA. In addition to anti-angiogenesis, other factors may contribute to the pathoetiology of BRONJ. Copyright © 2018 Elsevier Inc.

Vitamin D supplementation: Hypothetical effect on medication-related osteonecrosis of the jaw

Author(s): Lorenzo-Pouso A.I.; Perez-Sayans M.; Garcia A.; Carballo J.

Source: Medical Hypotheses; Jul 2018; vol. 116 ; p. 79-83

Publication Type(s): Article

Abstract: Vitamin D is an important nutrient for bone health and skeleton growth. Few foods are natural sources of this secosteroid; this is the reason why the consumption of vitamin D as a dietary supplement is becoming common in developed countries. For many years vitamin D has been

considered crucial in the treatment and prevention of the Global Burden of Disease and in a reduction in mortality among elder people. Many health care providers prescribe these supplements in the management of osteoporosis and metabolic bone diseases; specifically in the primary prevention of fractures. Recently medication-related osteonecrosis of the jaw (MRONJ) has been reported as severe late sequelae of antiresorptive therapies (i.e., bisphosphonates and some monoclonal antibodies). Although MRONJ-related pathophysiology is not fully understood, there are three fundamental theories to explain it: (1) the inhibition of osteoclasts, (2) the inhibition of angiogenesis and (3) the processes of inflammation-infection. Recent advances in Vitamin D research have shown that this secosteroid can play a potential pivotal role in many of the different etiological pathways of MRONJ. Furthermore, there are a large number of co-morbidities between the deficit of this vitamin and other MRONJ concomitant outcomes. Our hypothesis argues that the low-risk and low-cost vitamin D dietary supplementation may prove to be suitable for use as a practical MRONJ prevention strategy. The described framework gives more insight into the study of disease mechanisms, search of potential biomarkers, and therapeutic targets in MRONJ. Copyright © 2018 Elsevier Ltd

A multicenter case registry study on medication-related osteonecrosis of the jaw in patients with advanced cancer

Author(s): Schioldt M.; Vadhan-Raj S.; Chambers M.S.; Nicolatou-Galitis O.; Politis C.; Coropciuc R.

Source: Supportive Care in Cancer; Jun 2018; vol. 26 (no. 6); p. 1905-1915

Publication Type(s): Article

Available at [Supportive Care in Cancer](#) - from PubMed Central

Abstract: Purpose: This observational case registry study was designed to describe the natural history of cancer patients with medication-related osteonecrosis of the jaw (ONJ) and evaluate the ONJ resolution rate. Methods: Adults with a diagnosis of cancer and with a new diagnosis of ONJ were enrolled and evaluated by a dental specialist at baseline and every 3 months for 2 years and then every 6 months for 3 years until death, consent withdrawal, or loss to follow-up. The primary endpoint was the rate and time course of ONJ resolution. Secondary endpoints included frequency of incident ONJ risk factors, ONJ treatment patterns, and treatment patterns of antiresorptive agents for subsequent ONJ. Results: Overall, 327 patients were enrolled; 207 (63%) were continuing on study at data cutoff. Up to 69% of evaluable patients with ONJ had resolution or improvement during the study. ONJ resolution (AAOMS ONJ staging criteria) was observed in 114 patients (35%); median (interquartile range) time from ONJ onset to resolution was 7.3 (4.5-11.4) months. Most patients (97%) had received antiresorptive medication before ONJ development, 9 patients (3%) had not; 68% had received zoledronic acid, 38% had received denosumab, and 10% had received pamidronate (56% had received bisphosphonates only, 18% had received denosumab only, and 21% had exposure to both). Conclusions: These results are consistent with those observed in clinical trials evaluating skeletal-related events in patients with advanced malignancy involving bone. Longer follow-up will provide further information on ONJ recurrence and resolution rates between medically and surgically managed patients. Copyright © 2017, The Author(s).

Bisphosphonate-related osteonecrosis of the jaw: a mechanobiology perspective

Author(s): George E.L.; Saunders M.M.; Lin Y.-L.

Source: Bone Reports; Jun 2018; vol. 8 ; p. 104-109

Publication Type(s): Review

Available at [Bone Reports](#) - from Europe PubMed Central - Open Access

Abstract: Bisphosphonate-related osteonecrosis of the jaw (BRONJ) is a dramatic disintegration of the jaw that affects patients treated with bisphosphonates (BPs) for diseases characterized by bone loss. These diseases are often metastasizing cancers (like multiple myeloma, breast cancer and prostate cancer (Aragon-Ching et al., 2009)) as well as osteoporosis. BRONJ is incompletely understood, although it is believed to arise from a defect in bone remodeling—the intricate process by which sensory osteocytes signal to osteoclasts and osteoblasts to resorb and form bone in response to stimuli. Further, tooth extraction and infection have been overwhelmingly linked to BRONJ (Ikebe, 2013). Because bone cells are highly networked, the importance of multicellular interactions and mechanotransduction during the onset of these risk factors cannot be overstated. As such, this perspective addresses current research on the effects of BPs, mechanical load and inflammation on bone remodeling and on development of BRONJ. Our investigation has led us to conclude that improved in vitro systems capable of adequately recapitulating multicellular communication and incorporating effects of osteocyte mechanosensing on bone resorption and formation are needed to elucidate the mechanism(s) by which BRONJ ensues. Copyright © 2018

Development of antiresorptive agent-related osteonecrosis of the jaw after dental implant removal: a case report.

Author(s): Yamamoto, Shinsuke; Maeda, Keigo; Kouchi, Izumi; Hirai, Yuzo; Taniike, Naoki

Source: The Journal of oral implantology; Jun 2018

Publication Type(s): Journal Article

Abstract: Dental implant treatment is a highly predictable therapy, but when potentially lethal symptoms or complications occur, dentists must remove the implant fixture. Reports on antiresorptive agent-related osteonecrosis of the jaw have increased in the field of dental implants recently, although the relationship between dental implant treatment and antiresorptive agents remains unclear. Here we report a case of antiresorptive agent-related osteonecrosis of the jaw that developed after dental implant removal. A 67-year-old Japanese woman with a medical history of osteoporosis and 7 years of oral bisphosphonate treatment was referred to our hospital with a chief complaint of painful right mandibular bone exposure. A family dentist removed the dental implants from the right mandible using a trephine drill without flap elevation in August 2016. However, the healing was impaired; she was referred to our hospital 3 months after the procedure. We performed a sequestrectomy of the mandible under general anesthesia. In conclusion, this patient's course has two important implications. First, the removal of dental implants from patients who are prescribed oral bisphosphonates for long durations can cause antiresorptive agent-related osteonecrosis of the jaw. Second, meticulous procedures are required to prevent and treat the development of antiresorptive agent-related osteonecrosis of the jaw after dental implant removal.

Recommendations for the Prevention of Bisphosphonate-Related Osteonecrosis of the Jaw: A Systematic Review.

Author(s): Aparecida Cariolatto, Flávia; Carelli, Julia; de Campos Moreira, Taís; Pietrobon, Ricardo

Source: The journal of evidence-based dental practice; Jun 2018; vol. 18 (no. 2); p. 142-152

Publication Type(s): Journal Article

Abstract: OBJECTIVE The aim of this study was to assess the quality of and outline the differences among recommendations of published clinical practice guidelines (CPGs) for the management of bisphosphonate-associated osteonecrosis of the jaw. METHODS We conducted a systematic literature search in PubMed, Cochrane, Embase, Web of Science, and Google web site. We selected CPGs supported by a nongovernmental organization or national institutes, related to bisphosphonate-associated osteonecrosis of the jaw in adults, in English language, and dated from January 2008 onward. The validity of each included CPG was appraised according to 2 validated appraisal tools for

CPG that were independently used by 2 reviewers. RESULTS We identified 724 articles, of which 13 were included based on our eligibility criteria. Most CPGs were of good quality based on the appraisal tools for CPGs used in this study. CONCLUSION We did not find consensus on all the recommendations of the evaluated CPGs. Thus, each clinical case must be assessed individually, considering the risks and benefits on the proposed dental treatment.

Periodontal infection affects the severity of the medication-related osteonecrosis of the jaw (MRONJ)

Author(s): Lee J.K.

Source: Calcified Tissue International; May 2018; vol. 102 (no. 1)

Publication Type(s): Conference Abstract

Abstract: Periodontal infection is one of the most prevalent oral diseases. MRONJ is not frequent but once occurred, is one of the most tenacious diseases that severely affects the victims' quality of life. Although it is well known that periodontal disease is one of risk factors of the MRONJ, it is not clear if periodontal disease affects the severity of the MRONJ. Purpose of the study was to investigate the relationship of periodontal infection to the severity of the MRONJ. Of all patients diagnosed as MRONJ since 2006 in our department, total number of the study object was 86 excluding one patient whose radiograph was unavailable and 6 patients who were totally edentulous. MRONJ stage was evaluated with usual manners recommended in AAOMS position paper and the patients were classified into 4 groups. Periodontal infection was evaluated by 2 indices, alveolar bone score and residual tooth rate, in each of the 4 groups. All the patients were included in this study according to recommendations of the institutional review board in our hospital. Statistical analysis was done by Kruskal-Willis test and t test, according to classification criteria. The number of patients in each groups were 10, 20, 47, and 9 in stage 0, stage 1, stage 2, and stage 3, respectively. Kruskal-Wallis test yielded statistical difference only in alveolar bone score between stage 1 and 2 groups in post-hoc test ($p = 0.009$). Those 4 groups were rearranged according to the criteria of infection to yield infection-free (stage 0 and 1) group and infection-related (stage 2 and 3) group. The result of t test for mean comparison of these 2 groups in alveolar bone score was also statistically meaningful ($p = 0.004$). On the basis of these results we concluded that periodontal infection is related to stage of MRONJ and affects the severity of the MRONJ.

Changes in dimension of neurovascular canals in the mandible and maxilla: A radiographic finding in patients diagnosed with MRONJ

Author(s): Goller-Bulut D.; Ozcan G.; Avci F.

Source: Medicina Oral Patologia Oral y Cirugia Bucal; May 2018; vol. 23 (no. 3)

Publication Type(s): Article

Available at [Medicina Oral, Patología Oral y Cirugía Bucal](#) - from PubMed Central

Abstract: Background: The aim of this retrospective study was to compare the morphological features of neurovascular canals and foramina of patients with medication-related osteonecrosis of the jaws (MRONJ) and healthy individuals by using cone beam computed tomography (CBCT). Material and Methods: The CBCT images of 58 patients under bisphosphonate therapy diagnosed with MRONJ and age gender- matched controls were retrospectively evaluated. The diameter of mandibular and nasopalatine canal and mandibular, mental and lingual foramina were measured on several sections of CBCT. The value of mental index (MI) and panoramic mandibular index (PMI) were also assessed. Results: The mean value of diametric measurements for all neurovascular canals and foramina in MRONJ patients were narrower than controls. Left mandibular foramen was the most affected area ($p < 0.001$). There were significantly difference in all measurements of mental foramen, lingual foramen and mandibular incisive canal between two groups ($p < 0.05$). PMI of

MRONJ subjects were also significantly differences in both sides ($p < 0.05$). Conclusions: In MRONJ patient, neurovascular canals and foramina are affected due to the alterations in bone remodeling. Therefore, the diametric measurement of neurovascular canals and assessment of MI and PMI on CBCT, is a potentially useful method for detection of early changes associated with bisphosphonate therapy and for predict areas where new necrosis may occur. Copyright © 2018, Medicina Oral S.L. All rights reserved.

Panoramic radiographic features that predict the development of bisphosphonate-related osteonecrosis of the jaw

Author(s): Kubo R.; Arijji Y.; Nozawa M.; Arijji E.; Taniguchi T.; Katsumata A.

Source: Oral Radiology; May 2018; vol. 34 (no. 2); p. 151-160

Publication Type(s): Article

Abstract: Objectives: The purpose of this study was to clarify which panoramic radiographic features can predict the development of bisphosphonate-related osteonecrosis of the jaw (BRONJ). Methods: Participants included 24 patients treated with bisphosphonates (BP) for osteoporosis who developed osteonecrosis of the jaw (ONJ+ group). Controls included 179 patients treated with BP who did not have osteonecrosis (ONJ- group) and 200 patients with no history of BP administration (unmedicated group). The mandibular cortical width, mandibular cortical index (MCI), sclerosis of trabecular bone, and thickening of the lamina dura were evaluated on panoramic radiographs. Results: The mandibular cortical width was significantly smaller in the ONJ- group than in the other groups. Class II MCI (semilunar defects of endosteal margin) was frequently noted on the affected and contralateral sides in the ONJ+ group but not in the ONJ- or unmedicated groups. Sclerosis of the trabecular bone was significantly more frequently observed on the affected side in the ONJ+ group than in the other groups. Thickening of the lamina dura was observed significantly more frequently in the BP-treated groups than in the unmedicated group. Conclusions: Class II MCI may be an indicator to predict the development of BRONJ. Sclerosis of trabecular bone was a characteristic imaging feature of BRONJ. Thickening of the lamina dura may be an imaging feature caused by BP administration. Copyright © 2017, Japanese Society for Oral and Maxillofacial Radiology and Springer Japan KK.

Can Autofluorescence Guide Surgeons in the Treatment of Medication-Related Osteonecrosis of the Jaw? A Prospective Feasibility Study

Author(s): Giudice A.; Fortunato L.; Bennardo F.; Barone S.; Antonelli A.; Figliuzzi M.M.

Source: Journal of Oral and Maxillofacial Surgery; May 2018; vol. 76 (no. 5); p. 982-995

Publication Type(s): Article

Abstract: Purpose: The main limitation of surgical treatment of medication-related osteonecrosis of the jaw (MRONJ) is difficulty in defining resection margins. The aim of this study was to compare the efficacy of the surgeon's experience and autofluorescence-guided bone surgery to delimit resection margins for necrotic bone. Materials and Methods: MRONJ requiring surgical treatment was classified according to American Association of Oral and Maxillofacial Surgeons staging. To detect vital bone and resection margins, patients of each stage were randomly assigned to 1 of 2 surgical groups: an autofluorescence-guided surgery (AF) group and a conventional surgery (non-AF) group based on the surgeon's experience. Bone samples from the 2 groups were analyzed histopathologically. The main outcomes were defined as the absence of bone exposure or infection at the time of evaluation. Infection was defined as the presence of swelling, pain, or numbness in the area. Measurements were collected preoperatively and 1 week, 1 month, 6 months, and 1 year after surgery. Statistical analysis included descriptive statistics and the Fisher exact test to evaluate eventual differences between the 2 surgical protocols. Results: The 36 patients (21 women and 15

men) included in this study were equally divided into 2 groups according to the surgical protocol: 18 patients in the non-AF group and 18 in the AF group. Thirty-nine lesions were included in this analysis: 20 lesions in the non-AF group and 19 in the AF group. Histopathologic examination confirmed the necrotic nature of all bone samples. Statistical analysis showed no differences in necrotic bone exposure or signs of infections between the 2 surgical protocols at different times ($P > .05$). Conclusions: Although the VELscope appears to be useful in guiding bone resection margins in patients with MRONJ, autofluorescence does not appear to be superior to conventional surgical techniques in mucosal healing and quality of life. Copyright © 2017 American Association of Oral and Maxillofacial Surgeons

Conservative surgical treatment of medication related osteonecrosis of the jaw (MRONJ) lesions in patients affected by osteoporosis exposed to oral bisphosphonates: 24 months follow-up.

Author(s): Nisi, Marco; Karapetsa, Dimitra; Gennai, Stefano; Ramaglia, Luca; Graziani, Filippo

Source: Journal of cranio-maxillo-facial surgery : official publication of the European Association for Cranio-Maxillo-Facial Surgery; May 2018

Publication Type(s): Journal Article

Abstract:The purpose of the study was to evaluate the efficacy of conservative surgical treatment of medication related osteonecrosis of the jaw (MRONJ) in patients affected by osteoporosis and exposed to oral bisphosphonates (BPs). Subjects diagnosed with MRONJ and osteoporosis under oral BPs that had undergone conservative surgery and had at least 24 months follow-up were included. All patients received medical-antibiotic therapy and then underwent conservative surgical treatment consisting of sequestrectomy, soft tissue debridement and bone curettage with limited or no extension. A total of 53 patients, mean age of 71.9 ± 10.2 years (range 41-87), were enrolled. Two years after conservative surgical therapy 45 patients (91.8%) showed complete healing. The presence of rheumatoid arthritis ($p = 0.003$) and a more severe initial MRONJ stage ($p = 0.023$) were associated with a negative surgical outcome while the presence of bone sequestrum was strongly associated with a positive outcome ($p = 0.036$). Conservative surgical treatment of MRONJ lesions in patients affected by osteoporosis and receiving only oral BPs may represent a valid therapeutic approach determining a high number of complete healing cases. Conservative surgery should be encouraged at early MRONJ stages and after medical therapy failure.

Medication-related osteonecrosis of the jaw: An update on the memorial sloan kettering cancer center experience and the role of premedication dental evaluation in prevention.

Author(s): Owosho, Adepitan A; Liang, See Toh Yoong; Sax, Adi Z; Wu, Kant; Yom, SaeHee K

Source: Oral surgery, oral medicine, oral pathology and oral radiology; May 2018; vol. 125 (no. 5); p. 440-445

Publication Date: May 2018

Publication Type(s): Journal Article

Abstract:OBJECTIVEThe aim of this study was to investigate the relationship between type of antiresorptive medication and medication-related osteonecrosis of the jaw (MRONJ) onset and the role of premedication dental evaluation (PMDE) in the prevention of MRONJ.STUDY DESIGNOur database of patients with MRONJ was reviewed. The Kruskal-Wallis test was used to analyze the onset dose of the 3 frequent medication types associated with MRONJ. To evaluate the role of PMDE in the prevention of MRONJ, all patients on antiresorptive and/or antiangiogenic medications seen in the Dental Service of Memorial Sloan Kettering Cancer Center during a 10-year period were subclassified into 2 groups. Group I comprised patients seen for PMDE before the commencement of A/A and group II patients seen after prior exposure to antiresorptive and/or antiangiogenic medications. Fischer's exact test was used to compare the incidence of MRONJ in both

groups. **RESULTS** Patients on denosumab developed MRONJ earlier compared with zoledronate and pamidronate ($P = .003$). Group I had a significantly reduced incidence of MRONJ (0.9%) compared with group II (10.5%) ($P < .0001$). Dentoalveolar trauma as a precipitating factor between groups I and II was not statistically significant. **CONCLUSIONS** Denosumab was associated with an earlier occurrence of MRONJ compared with zoledronate and pamidronate. The role of PMDE may be an effective preventive strategy in reducing the incidence of MRONJ.

Denosumab-related osteonecrosis of the jaw following non-surgical periodontal therapy: A case report.

Author(s): Diniz-Freitas, Márcio; Fernández-Feijoo, Javier; Diz Dios, Pedro; Pousa, Xiana;

Source: Journal of clinical periodontology; May 2018; vol. 45 (no. 5); p. 570-577

Publication Type(s): Case Reports

Abstract: **INTRODUCTION** Osteonecrosis of the jaw associated with bisphosphonates is currently called medication-related osteonecrosis of the jaw (MRONJ), given that in addition to bisphosphonates, jaw osteonecrosis has been related to the administration of other antiresorptive and antiangiogenic drugs, such as denosumab, sunitinib, bevacizumab and ipilimumab. **CASE PRESENTATION** A 77-year-old patient with osteoporosis treated with subcutaneous injections of denosumab at an interval of 6 months is presented. The patient developed MRONJ after receiving a non-surgical periodontal therapy. Although the MRONJ was initially classified as a stage I lesion in this patient, cone beam computed tomography images confirmed the presence of a significant osteolytic lesion. Treatment consisted of the administration of chlorhexidine mouthwash and systemic doxycycline, exodontia of the involved teeth, sequestrectomy and complete surgical debridement of the necrotic bone. **CONCLUSION** To our knowledge, this is the first case reported in the literature of MRONJ following non-surgical periodontal therapy in a patient with osteoporosis treated with denosumab. The risk of MRONJ development after a periodontal procedure and how to prevent this complication are still unknown.

CT imaging features of antiresorptive agent-related osteonecrosis of the jaw/medication-related osteonecrosis of the jaw.

Author(s): Baba, Akira; Goto, Tazuko K; Ojiri, Hiroya; Takagiwa, Mutsumi; Hiraga, Chiho;

Source: Dento maxillo facial radiology; May 2018; vol. 47 (no. 4); p. 20170323

Publication Type(s): Journal Article

Abstract: **OBJECTIVES** Antiresorptive agent-related osteonecrosis of the jaw (ARONJ)/medication-related osteonecrosis of the jaw (MRONJ) include both bisphosphonate-related osteonecrosis of jaw (BRONJ) and denosumab-related osteonecrosis of jaw (DRONJ). The purpose of this study is to study radiological characteristics of ARONJ/MRONJ. These imaging features may serve as one useful aid for assessing ARONJ/MRONJ. **METHODS** SCT scans of 74 Japanese patients, who were clinically diagnosed by inclusion criteria of ARONJ/MRONJ, obtained between April 1, 2011 and September 30, 2016, were evaluated. We investigated the CT imaging features of ARONJ/MRONJ, and clarified radiological differentiation between BRONJ and DRONJ, BRONJ due to oral bisphosphonate administration and due to intravenous bisphosphonate administration, BRONJ with respective kinds of medication, BRONJ with long-term administration and short-term administration, BRONJ with each clinical staging respectively. Fisher's exact test, χ^2 test, Student's t-test and analysis of variance were performed in the statistical analyses. **RESULTS** Unilateral maxillary sinusitis was detected in all patients with upper ARONJ/MRONJ (100%). DRONJ showed large sequestrum more frequently than BRONJ (3/4, 75 vs 3/35, 8.6%, $p < 0.05$). DRONJ showed periosteal reaction more frequently than BRONJ (4/10, 40 vs 7/65, 10.1%, $p < 0.05$). Patients of BRONJ resulting from intravenous bisphosphonate administration showed larger and more frequent buccolingual cortical bone

perforations than BRONJ resulting from oral bisphosphonate administration (7/8, 87.5 vs 11/30, 36.7%, $p < 0.05$). There was no significant correlation between CT findings and respective kinds of medication, long/short-term administration, clinical stages of BRONJ. CONCLUSIONS ARONJ/MRONJ has characteristic CT image findings which could be useful for its assessment.

Maxillofacial

Laser-speckle imaging to measure tissue perfusion in free flaps in oral and maxillofacial surgery: a potentially exciting and easy to use monitoring method

Author(s): Brennan P.A.; Brands M.T.; Alam P.; Gush R.

Source: British Journal of Oral and Maxillofacial Surgery; 2018

Publication Type(s): Article In Press

Toxic Epidermal Necrolysis: A Dermatologic Emergency and the Role of the Oral and Maxillofacial Surgeon

Author(s): Wolf B.; Sadoff R.; Nannini V.

Source: Journal of Oral and Maxillofacial Surgery; 2018

Publication Type(s): Article In Press

Abstract: Toxic epidermal necrolysis (TEN) is a rare and severe mucocutaneous disorder characterized by mucosal and epidermal necrosis and sloughing. This potentially life-threatening condition, together with the less severe Stevens-Johnson syndrome, is commonly caused by an immunologic reaction to medications and can lead to many long-term complications. The disorder initially presents with fever, malaise, and painful mucosal ulcerations (most commonly oral) but progresses to widespread cutaneous lesions. A 14-year-old male patient was prescribed minocycline for treatment of his acne by his primary care doctor. Three weeks into the antibiotic treatment, he was admitted in distress, with a diagnosis of Stevens-Johnson syndrome that subsequently progressed to TEN. We present a discussion of the importance of early recognition and diagnosis of this condition by oral and maxillofacial surgeons and a description of our patient's treatment and management during his hospital stay. Copyright © 2018

A simple method to locate mandibular foramen with cone-beam computed tomography and its relevance to oral and maxillofacial surgery: a radio-anatomical study

Author(s): Al-Shayyab M.H.

Source: Surgical and Radiologic Anatomy; Jun 2018; vol. 40 (no. 6); p. 625-634

Publication Type(s): Article

Abstract: Purpose: The mandibular foramen (MF) cannot be palpated clinically and its location is variable at the medial surface of mandibular ramus. Nevertheless, determining its exact location is very important to the oral and maxillofacial surgeon for the relevant anesthetic and surgical ramus procedures. The aim of this study was to analyze the position of MF using cone-beam computed tomography (CBCT) to help the surgeon in identifying reliable 'target area' for the inferior alveolar nerve (IAN) block and 'safety zone' for mandibular ramus osteotomies approached extra-orally. Materials and methods: This radio-anatomical study examined all CBCT radiographs for patients treated over 2 years. Distances from MF to the anterior (A) and posterior (P) borders of the ramus, mandibular incisura (MI), mandibular notch (MN), and mandibular occlusal plane (O) were measured by a reliable examiner, followed by calculation of ratios to determine the horizontal and vertical

position of MF. Patients' details were then recorded. Student's t test and One-Way-ANOVA test were used to analyze data. Results: A total of 210 CBCT radiographs were included and belonged to 210 subjects; 91 males (43.3%) and 119 (56.7%) females, with mean age (+/- SD) of 43.70 +/- 19.08 years. The horizontal and vertical positions of MF differed significantly ($P < 0.001$) according to age, but generally calculated at least 40% of AP and MIMN distances from P and MI, respectively. Conclusion: This study suggested the '40% rule' to locate the 'target area' for IAN block and 'safety zone' for ramus osteotomies approached extra-orally. Copyright © 2018, Springer-Verlag France SAS, part of Springer Nature.

A novel rotational matrix and translation vector algorithm: geometric accuracy for augmented reality in oral and maxillofacial surgeries

Author(s): Murugesan Y.P.; Alsadoon A.; Prasad P.W.C.; Manoranjan P.

Source: International Journal of Medical Robotics and Computer Assisted Surgery; Jun 2018; vol. 14 (no. 3)

Publication Type(s): Article

Abstract:Background: Augmented reality-based surgeries have not been successfully implemented in oral and maxillofacial areas due to limitations in geometric accuracy and image registration. This paper aims to improve the accuracy and depth perception of the augmented video. Methodology: The proposed system consists of a rotational matrix and translation vector algorithm to reduce the geometric error and improve the depth perception by including 2 stereo cameras and a translucent mirror in the operating room. Results: The results on the mandible/maxilla area show that the new algorithm improves the video accuracy by 0.30-0.40 mm (in terms of overlay error) and the processing rate to 10-13 frames/s compared to 7-10 frames/s in existing systems. The depth perception increased by 90-100 mm. Conclusion: The proposed system concentrates on reducing the geometric error. Thus, this study provides an acceptable range of accuracy with a shorter operating time, which provides surgeons with a smooth surgical flow. Copyright © 2018 John Wiley & Sons, Ltd.

Postoperative nausea and vomiting after oral and maxillofacial surgery: a prospective study

Author(s): Dobbeleir M.; Coucke W.; Politis C.; De Coster J.

Source: International Journal of Oral and Maxillofacial Surgery; Jun 2018; vol. 47 (no. 6); p. 721-725

Publication Type(s): Article

Abstract:Postoperative nausea and vomiting (PONV) is one of the most unpleasant experiences after surgery. It reduces patient satisfaction and also increases hospital costs due to longer hospitalizations. The aim of this prospective study was to determine whether orthognathic surgery is associated with more PONV than less invasive maxillofacial surgery. Three hundred and eight patients aged 8-87 years who underwent maxillofacial surgery were included. The PONV score, based on the Apfel score, was calculated preoperatively. PONV occurred in 142 (46.1%) patients during the first three postoperative days; these patients were further categorized as having postoperative nausea (PON) and/or postoperative vomiting (POV). PON was most frequent after orthognathic surgery to the mandible (75%), and POV was most frequent after maxillary surgery, including bimaxillary surgery, Le Fort I osteotomy, and surgically assisted rapid palatal expansion (SARPE) (43.1%). There was a small significant relationship between the preoperative PONV score and the incidence of PONV: patients experienced more PONV when the PONV score calculated preoperatively was higher. The incidence of PONV after orthognathic surgery was very high compared with the incidence after dental extractions and other minor surgeries. Further investigation is required to establish a strategy to reduce PONV after orthognathic surgery. Copyright © 2017 The Authors

A Review of Haptic Simulator for Oral and Maxillofacial Surgery Based on Virtual Reality.

Author(s): Chen, Xiaojun; Hu, Junlei

Source: Expert review of medical devices; Jun 2018

Publication Type(s): Journal Article

Abstract:INTRODUCTIONTraditional medical training in oral and maxillofacial surgery may be limited by its low efficiency and high price due to the shortage of cadaver resources. With the combination of visual rendering and feedback force, surgery simulators become increasingly popular in hospitals and medical schools as an alternative to the traditional training. Areas covered: The major goal of this review is to provide a comprehensive reference source of current and future developments of haptic oral and maxillofacial surgery simulators based on virtual reality for relevant researchers. Expert commentary: Visual rendering, haptic rendering, tissue deformation and evaluation are key components of haptic surgery simulator based on virtual reality. Compared with traditional medical training, virtual and tactical fusion of virtual environment in surgery simulator, enables considerably vivid sensation, and the operators have more opportunities to practice surgical skills and receive objective evaluation as reference.

Robotics in oral and maxillofacial surgery

Author(s): Borumandi F.; Cascarini L.

Source: Annals of the Royal College of Surgeons of England; May 2018; vol. 100 (no. 6); p. 16-18

Publication Type(s): Review

Available at [Annals of the Royal College of Surgeons of England](#) - from EBSCO (MEDLINE Complete)

Systematic review of benefits or harms of routine anaesthetist-inserted throat packs in adults: practice recommendations for inserting and counting throat packs: An evidence-based consensus statement by the Difficult Airway Society (DAS), the British Association of Oral and Maxillofacial Surgery (BAOMS) and the British Association of Otorhinolaryngology, Head and Neck Surgery (ENT-UK)

Author(s): Athanassoglou V.; Pandit J.J.; Patel A.; McGuire B.; Higgs A.; Dover M.S.; Brennan P.A.

Source: Anaesthesia; May 2018; vol. 73 (no. 5); p. 612-618

Publication Type(s): Review

Abstract:Throat packs are commonly inserted by anaesthetists after induction of anaesthesia for dental, maxillofacial, nasal or upper airway surgery. However, the evidence supporting this practice as routine is unclear, especially in the light of accidentally retained throat packs which constitute 'Never Events' as defined by NHS England. On behalf of three relevant national organisations, we therefore conducted a systematic review and literature search to assess the evidence base for benefit, and also the extent and severity of complications associated with throat pack use. Other than descriptions of how to insert throat packs in many standard texts, we could find no study that sought to assess the benefit of their insertion by anaesthetists. Instead, there were many reports of minor and major complications (the latter including serious postoperative airway obstruction and at least one death), and many descriptions of how to avoid complications. As a result of these findings, the three national organisations no longer recommend the routine insertion of throat packs by anaesthetists but advise caution and careful consideration. Two protocols for pack insertion are presented, should their use be judged necessary. Copyright © 2018 The Association of Anaesthetists of Great Britain and Ireland

Providing Anesthesia in the Oral and Maxillofacial Surgery Office: A Look Back, Where We Are Now and a Look Ahead

Author(s): Lieblich S.

Source: Journal of Oral and Maxillofacial Surgery; May 2018; vol. 76 (no. 5); p. 917-925

Publication Type(s): Review

Abstract: Throughout its development the practice of oral and maxillofacial surgery has been richly associated with the provision of anesthetic services. Dentists and particularly oral and maxillofacial surgeons have advanced the science associated with anesthesia especially in the outpatient setting. This article will look back on the development of anesthesia as it relates to oral and maxillofacial surgery, discuss the current mode of anesthesia in the oral surgeon's practice and look ahead to what innovations are advancing this field. Copyright © 2018 American Association of Oral and Maxillofacial Surgeons

Comparison of intravenous tramadol versus ketorolac in the management of postoperative pain after oral and maxillofacial surgery.

Author(s): Degala, Saikrishna; Nehal, Asad

Source: Oral and maxillofacial surgery; May 2018

Publication Type(s): Journal Article

Abstract: BACKGROUND The aim of this study was to assess the better postoperative analgesic, tramadol, and ketorolac, in patients with maxillofacial trauma and who had undergone maxillofacial surgery, i.e., open reduction internal fixation, under general anesthesia. MATERIALS AND METHODS After taking ethical approval from the institution and informed consent, 46 ASA grade I-II patients were block randomized (ABAB) based on inclusion and exclusion criteria and equally divided into two groups in which one group of patients was given intravenous tramadol 100 mg and another group of patients was given intravenous ketorolac 30 mg at the time of closure of skin and was repeated after 8 and 16 h following surgery. Pain using VAS at the 2nd, 4th, 6th, 12th, and 24th postoperative was assessed, and association of results was compared using Cramer's V test SPSS (Version 22). Vital signs and side effects were recorded. RESULTS Although both drugs resulted in significant decrease in pain intensity from the 2nd to 24th postoperative hour, intravenous tramadol always resulted in better pain control than intravenous ketorolac at every postoperative hour (p value 0.05). CONCLUSION Apart from first 2 h where the changes are non-significant, this study clearly demonstrates the advantage of the intravenous tramadol in the management of postoperative pain and ease of administration in postoperative patient through IV cannula. The side effects of both the drugs were insignificant and did not have any effect on the result.

Anesthesia considerations for the oral and maxillofacial surgeon.

Author(s): Cannon, Brandon

Source: Cranio : the journal of craniomandibular practice; May 2018 ; p. 1

Publication Type(s): Journal Article

Clinical efficacy of new α -bisabolol mouthwashes in postoperative complications of maxillofacial surgeries: a randomized, controlled, triple-blind clinical trial.

Author(s): Amora-Silva, Bruno Frota; Ribeiro, S C; Vieira, C L; Mendes, F R; Vieira-Neto, A E;

Source: Clinical oral investigations; May 2018

Publication Type(s): Journal Article

Abstract:OBJECTIVEThe present study aimed to evaluate the efficacy of α -bisabolol (BISA)-based mouthwashes in the oral hygiene of patients submitted to oral and maxillofacial surgery.MATERIALS AND METHODSARandomized, controlled, triple-blind clinical trial was conducted with 30 patients, undergoing oral and maxillofacial surgery. Three types of mouthwashes were developed, based at 0.12% chlorhexidine, 0.5% BISA, and 0.12% chlorhexidine + 0.5% BISA. The patients were evaluated in the preoperative and postoperative period, divided into three groups according to the mouthwash to be used. In the postoperative period, the oral hygiene quality of the patients was evaluated through the simplified oral hygiene index; the healing of the wounds was evaluated observing the presence of suture dehiscence and/or infection, and the pain was established using the Visual Analogue Scale. The antiseptic effect of the mouthwashes was evaluated in vitro.RESULTSThere were no differences in the efficacy of BISA-containing mouthwashes for oral hygiene, healing, and pain, compared to chlorhexidine based at 0.12%. There were no differences in the antiseptic activity of chlorhexidine and chlorhexidine + α -bisabolol-based mouthwashes.CONCLUSIONThe results indicate that BISA-based mouthwashes have clinical efficacy, in the improvement of oral hygiene and wound healing, as well as in the reduction of postoperative pain.CLINICAL RELEVANCEConsidering that BISA has analgesic, antimicrobial, and anti-inflammatory properties, it is relevant to evaluate the efficacy of BISA-based mouthwashes in the oral hygiene of patients undergoing oral and maxillofacial surgery, seeking a better postoperative recovery.

Accessory Mental Foramen and Maxillofacial Surgery.

Author(s): Rahpeyma, Amin; Khajehahmadi, Saeedeh

Source: The Journal of craniofacial surgery; May 2018; vol. 29 (no. 3); p. e216

Publication Type(s): Journal Article

Abstract:Accessory mental foramina should be considered in surgical procedures performed in mandibular body and symphysis. Location and content of these foramina has significant impact on the result of surgery.Lip numbness is the catastrophic result if these foramina are violated while their content is nerves that carry sensory inputs from lower lip. Examples of interferences with dental implant, orthognathic, and periapical surgeries are presented and it is discussed in which conditions they complicate oral surgical procedures.

The Failed Sedation: Solutions for the Oral and Maxillofacial Surgeon.

Author(s): Bosack, Robert C

Source: Oral and maxillofacial surgery clinics of North America; May 2018; vol. 30 (no. 2); p. 165-169

Publication Type(s): Journal Article Review

Abstract:Due to wide variation in patient responses, both intended and adverse, it is impossible to successfully sedate all patients. Choosing the right drug and dose regimen can be challenging, especially in patients who are naïve to anesthesia. Underdosing can lead to pain perception, patient movement and combativeness, awareness with recall, and the sympathetic neuroendocrine stress response. Overdosing can lead to unintended loss of upper airway tone, hypoventilation/apnea, adverse cardiovascular changes, and prolonged sedation (with its attendant problems).

Anesthetic Agents Commonly Used by Oral and Maxillofacial Surgeons.

Author(s): Kramer, Kyle J; Brady, Jason W

Source: Oral and maxillofacial surgery clinics of North America; May 2018; vol. 30 (no. 2); p. 155-164

Publication Type(s): Journal Article Review

Abstract: Oral and maxillofacial surgeons have a variety of anesthetic agents that can be used to provide anesthesia safely and efficiently in the office-based environment. However, it is critical to have a thorough understanding of the particulars for each agent. Commonly used anesthetic agents, administered either individually or in combination, include diazepam, midazolam, propofol, ketamine, opioid agonists such as fentanyl or remifentanyl, dexmedetomidine, and inhalational agents, including nitrous oxide and sevoflurane. These agents help provide extreme flexibility for those creating an individualized anesthetic plan that also balances the patient's history and the anticipated surgical plan to maximize success.

Oral and Maxillofacial Surgery Team Anesthesia Model and Anesthesia Assistant Training.

Author(s): Drew, Stephanie J

Source: Oral and maxillofacial surgery clinics of North America; May 2018; vol. 30 (no. 2); p. 145-153

Publication Type(s): Journal Article Review

Abstract: The model for oral and maxillofacial surgery (OMFS) delivery of office-based, open airway anesthesia has morphed from the operator-anesthetist to the delivery of team anesthesia, supporting a widespread focus on organizational aspects of the delivery of care. The training, continuing education, and coordination of a diverse anesthesia team provides a system to improve the safety and efficacy of anesthesia delivery. The hallmarks of this system include communication, checks and balances, monitoring, team dynamics, protocols, emergency scenario preparation and rehearsal, and crisis resource management during an emergent situation. This system contributes to and continually supports a culture of safety in the OMFS office.

Are You Ready for Emergency Medical Services in Your Oral and Maxillofacial Surgery Office?

Author(s): Rayner, Clive; Ragan, Michael R

Source: Oral and maxillofacial surgery clinics of North America; May 2018; vol. 30 (no. 2); p. 123-135

Publication Type(s): Journal Article Review

Abstract: Efficient responses to emergencies in the oral and maxillofacial surgery office require preparation, communication, and thorough documentation of the event and response. The concept of team anesthesia is showcased with these efforts. Emergency medical services training and response times vary greatly. The oral and maxillofacial surgery office should be prepared to manage the patient for at least 15 minutes after making the call to 911. Patient outcomes are optimized when providers work together to manage and transport the patient. Oral and maxillofacial surgery offices should develop and rehearse emergency plans and coordinate these protocols with local Emergency medical services teams.

Comparison of Nasal Intubations by GlideScope With and Without a Bougie Guide in Patients Who Underwent Maxillofacial Surgeries: Randomized Clinical Trial.

Author(s): Pourfakhr, Pejman; Ahangari, Ailar; Etezadi, Farhad; Moharari, Reza Shariat;

Source: Anesthesia and analgesia; May 2018; vol. 126 (no. 5); p. 1641-1645

Publication Type(s): Journal Article

Available at [Anesthesia & Analgesia](#) - from Ovid (Journals @ Ovid) - Remote Access

Abstract: BACKGROUND Nasotracheal intubation is commonly performed to provide a secure airway for the maintenance of general anesthesia in maxillofacial surgeries. Routine nasotracheal intubation is performed under general anesthesia by direct laryngoscopy, frequently with the aid of Magill forceps. This method can be time-consuming and may cause bleeding in the field of view. A gum elastic bougie (GEB) is a cheap, slender, and flexible device that could expedite nasotracheal

intubation. The aim of this study was to evaluate the use of a GEB during nasotracheal intubation to facilitate the procedure and reduce the rate of complications. **METHODS**In this randomized clinical trial study, 110 patients with American Society of Anesthesiologists (ASA) physical status I-II from 15 to 65 years of age were randomized into 2 equal groups. In both groups, a GlideScope and armored tube were used. In the GEB group, GEB was used to facilitate nasal intubation while the nasal intubation was performed without the aid of GEB in the routine group. The difficult intubation (defined as >1 attempt for intubation) was the primary outcome, and the duration of the intubation, the presence of traces of bleeding, the need for a tube replacement, and the usage of Magill forceps were the secondary outcomes. **RESULT**The incidence of bleeding in the GEB group was 1.81% vs 43.63% in the routine group ($P < .001$). In 5.5% of the GEB group, Magill forceps were used to advance the tube versus 67.3% in the routine group ($P < .001$). The mean time for intubation in GEB group was 48.63 ± 8.53 vs 55.9 ± 10.76 seconds in the routine group ($P < .001$). **CONCLUSION**The GEB is a useful aid to nasotracheal intubation, reducing bleeding, the requirement for Magill forceps and, to a small degree, intubation time. A case exists for its routine use for this purpose.

Cleft lip and palate

The maxillary lateral incisor in the rehabilitation of cleft lip and palate

Author(s): Tereza G.P.G.; Santos M.A.C.D.; Winckler V.P.S.V.; Dalben G.D.S.; Almeida A.L.P.F.

Source: Journal of applied oral science : revista FOB; 2018; vol. 26

Publication Type(s): Article

Available at [Journal of Applied Oral Science](#) - from PubMed Central

Abstract:Objective This study analyzed the maintenance of lateral incisors in the dental rehabilitation of individuals with cleft lip and palate. Material and Methods The study was conducted on a tertiary craniofacial center and comprised retrospective analysis of panoramic and periapical radiographs of Caucasoid individuals with non-syndromic complete unilateral cleft lip and palate, analyzing all radiographs available on the records of each individual, from the first to the last up to 12 years of age. Overall, 2,826 records were reviewed to achieve a sample of 1,000 individuals. Among these, 487 individuals presented the permanent lateral incisors on both cleft and non-cleft sides, which were included in this study. Results The results were evaluated in percentages and by descriptive statistics. The association between maintenance of the lateral incisor and timing of alveolar bone graft were analyzed by the t test. Among the 487 individuals, 265 had not completed treatment, 62 presented insufficient information, and 44 concluded the treatment elsewhere. Among the remaining 116 individuals, the lateral incisor was extracted from 88 (75.86%) of them on the cleft side (CS) and from 23 (19.83%) people on the non-cleft side (NCS). The age at accomplishment of alveolar bone graft was significantly associated with maintenance of the lateral incisor on the cleft side ($p < 0.01$). Most extractions were indicated because of the inadequate positioning on the CS and for midline correction on the NCS. Rehabilitation was primarily completed by orthodontic movement (53 individuals on the CS and 13 individuals on the NCS). Conclusion In conclusion, the lateral incisor on the cleft side was not maintained in most individuals. Positive relationship was observed between extraction of the lateral incisor and age at accomplishment of the alveolar bone graft, suggesting the need to anticipate the initial radiographic evaluation to enhance its maintenance and reduce the procedures required for rehabilitation.

Early development of the human dentition revisited

Author(s): Hovorakova M.; Peterka M.; Peterkova R.; Lesot H.

Source: Journal of Anatomy; 2018

Publication Type(s): Article In Press

Abstract:In this review, classical data on the early steps in human odontogenesis are summarized and updated with specific insights into the development of the upper and lower embryonic jaws to help in understanding some oral pathologies. The initial step of human odontogenesis is classically characterized by two parallel horseshoe-shaped epithelial laminae. These originate from the oral epithelium and an ingrowth into the jaw mesenchyme: the internal dental lamina gives rise to deciduous tooth primordia, while the external vestibular lamina represents the developmental base of the oral vestibule. However, a more complex situation was revealed by recent studies combining analyses of the dental and adjacent oral epithelia on histological sections and computer-aided three-dimensional (3D) reconstructions during the 2nd month of human embryonic development. The dental epithelium forms a mound, where swellings appear later, corresponding to the individual primordia of deciduous teeth. External to the developing deciduous dentition, the 3D reconstructions do not show any continuous vestibular lamina but instead a complex of discontinuous epithelial bulges and ridges. The patterns of these epithelial structures and their relationship to the dental epithelium differ not only between the upper and lower jaws but also between the lip and cheek segments in each jaw. Knowledge of early odontogenesis may help in understanding some oral pathologies. For example, the human lateral incisor has a dual origin: it arises in the area of fusion between the medial nasal and maxillary facial processes and involves material from these two regions. Such a dual origin at the site of fusion of facial processes represents a predisposition to developmental vulnerability for the upper lateral incisor, resulting in its frequent anomalies (absence, hypoplasia, duplication), especially in patients with a cleft lip and/or jaw. Other pathologies, such as a minute supernumerary tooth, desmoplastic ameloblastoma or extraosseous odontogenic cysts are located external to the upper or lower dentition, and might be derived from structures that transiently appear during early development of the oral vestibule in humans. *Journal of Anatomy* Copyright © 2018 Anatomical Society.

Gene-gene interaction for nonsyndromic cleft lip with or without cleft palate in Chilean case-parent trios.

Author(s): Suazo, José; Santos, José Luis; Colombo, Alicia; Pardo, Rosa

Source: *Archives of oral biology*; Jul 2018; vol. 91 ; p. 91-95

Publication Type(s): Journal Article

Abstract:OBJECTIVE Nonsyndromic cleft lip with or without cleft palate (NSCL/P) is a birth defect for which several genes susceptibility genes been proposed. Consequently, it has been suggested that many of these genes belong to common inter-related pathways during craniofacial development gene-gene interaction. We evaluated the presence of gene-gene interaction for single nucleotide polymorphisms within interferon regulatory factor 6 (IRF6), muscle segment homeobox 1 (MSX1), bone morphogenetic protein 4 (BMP4) and transforming growth factor 3 (TGFB3) genes in NSCL/P risk in Chilean case-parent trios. DESIGN From previous studies, we retrieved genotypes for 13 polymorphic variants within these four genes in 152 case-parent trios. Using the trio package (R) we evaluate the gene-gene interaction in genetic markers pairs applying a 1°-of-freedom test (1df) and a confirmatory 4°-of-freedom (4df) test for epistasis followed by both a permutation test and a Benjamini-Hochberg test for multiple comparisons adjustment. RESULTS We found evidence of gene-gene interaction for rs6446693 (MSX1) and rs2268625 (TGFB3) (4df p = 0.024; permutation p = 0.015, Benjamini-Hochberg p = 0.001). CONCLUSIONS A significant gene-gene interaction was detected for rs6446693 (MSX1) and rs2268625 (TGFB3). This finding is concordant with research in animal models showing that MSX1 and TGFB3 are expressed in common molecular pathways acting in an epistatic manner during maxillofacial development.

Three-dimensional development of the upper dental arch in unilateral cleft lip and palate patients after early neonatal cheiloplasty

Author(s): Hoffmannova E.; Moslerova V.; Dupej J.; Bejdova S.; Veleminska J.; Borsky J.

Source: International Journal of Pediatric Otorhinolaryngology; Jun 2018; vol. 109 ; p. 1-6

Publication Type(s): Article

Abstract: Objectives: This prospective morphometric study evaluated the growth of the upper dental arch in UCLP patients after early neonatal cheiloplasty and compared the selected dimensions with published data on non-cleft controls and on later operation protocol patients. Methods: The sample comprised 36 Czech children with nonsyndromic complete UCLP (cUCLP) and 20 Czech children with nonsyndromic incomplete UCLP (UCLP + b). 2-D and 3-D analyses of palatal casts were made at two time points: before neonatal cheiloplasty at the mean age of 3 days (+/-1 day), and 10 months after surgery at the mean age of 10 months (+/-1 month). Results: The upper dental arch of cUCLP and UCLP + b patients showed similar developmental changes, but the cleft type influenced growth significantly. The initial high shape variability in cUCLP patients diminished after 10 months, and approached the variability in UCLP + b patients. Both the width and length dimensions increased after surgery. Important growth concerned the anterior ends of both segments. The width and length dimensions illustrated similar growth trends with non-cleft controls and UCLP patients who underwent later cheiloplasty. Conclusion: Early neonatal cheiloplasty caused no reduction in the length or width dimensions during the first year of life. Our data suggest a reconstructed lip has a natural formative effect on the actively growing anterior parts of upper dental arch segments, which cause narrowing of the alveolar cleft. Copyright © 2018 Elsevier B.V.

Dental enamel defect diagnosis through different technology-based devices.

Author(s): Kobayashi, Tatiana Yuriko; Vitor, Luciana Lourenço Ribeiro;

Source: International dental journal; Jun 2018; vol. 68 (no. 3); p. 138-143

Publication Type(s): Journal Article

Abstract: INTRODUCTION Dental enamel defects (DEDs) are faulty or deficient enamel formations of primary and permanent teeth. Changes during tooth development result in hypoplasia (a quantitative defect) and/or hypomineralisation (a qualitative defect). OBJECTIVE To compare technology-based diagnostic methods for detecting DEDs. MATERIAL AND METHOD Two-hundred and nine dental surfaces of anterior permanent teeth were selected in patients, 6-11 years of age, with cleft lip with/without cleft palate. First, a conventional clinical examination was conducted according to the modified Developmental Defects of Enamel Index (DDE Index). Dental surfaces were evaluated using an operating microscope and a fluorescence-based device. Interexaminer reproducibility was determined using the kappa test. To compare groups, McNemar's test was used. Cramer's V test was used for comparing the distribution of index codes obtained after classification of all dental surfaces. RESULTS Cramer's V test revealed statistically significant differences ($P < .0001$) in the distribution of index codes obtained using the different methods; the coefficients were 0.365 for conventional clinical examination versus fluorescence, 0.961 for conventional clinical examination versus operating microscope and 0.358 for operating microscope versus fluorescence. The sensitivity of the operating microscope and fluorescence method was statistically significant ($P = .008$ and $P < .0001$, respectively). Otherwise, the results did not show statistically significant differences in accuracy and specificity for either the operating microscope or the fluorescence methods. CONCLUSION This study suggests that the operating microscope performed better than the fluorescence-based device and could be an auxiliary method for the detection of DEDs.

Optimal Xeno-free Culture Condition for Clinical Grade Stem Cells from Human Exfoliated Deciduous Teeth.

Author(s): Tangjit, Nathaphon; Dechkunakorn, Surachai; Anuwongnukroh, Niwat;

Source: International journal of stem cells; May 2018; vol. 11 (no. 1); p. 96-104

Publication Type(s): Journal Article

Available at [International journal of stem cells](#) - from Europe PubMed Central - Open Access

Abstract:Background and Objectives Stem cells from human exfoliated deciduous teeth (SHED) are a promising clinical resource for various tissue defects, including lumbar spondylosis, neural compression, and cleft palate. Use of media containing animal-derived serum carries potential risk of infectious diseases and unwanted immunogenicity. To increase the potential utility of SHED for clinical application, SHED was adapted to xeno-free conditions. Methods Define xeno-free culture media were compared with the conventional serum containing media in the culture of SHED. Cultured SHED in different media were further characterized through proliferative capacities, cellular phenotype, and differentiation potential. Results Selected xeno-free media were capable of supporting the growth of SHED. MSCGM-CD Bulletkit medium greatly increased the number and proliferate capacity of colony-forming unit-fibroblast than SHED cultured in other media. In addition, the characteristic surface markers expression and multipotent differentiation potential of SHED in the MSCGM-CD Bulletkit medium were comparable to those observed with serum-containing medium. Conclusions The xeno-free medium described herein has the potential to be further used for the safe expansion and to determine efficient way to produce clinical grade dental stem cells for therapeutic applications.

Permanent maxillary central incisor and first molar rotations in the mixed dentition in repaired complete unilateral cleft lip and palate and their relationship with absence of teeth in their vicinity.

Author(s): Suri, Sunjay; Disthaporn, Suteeta; Ross, Bruce; Tompson, Bryan; Baena, Diogenes;

Source: The Angle orthodontist; May 2018

Publication Type(s): Journal Article

Abstract:OBJECTIVE To describe qualitatively and quantitatively the directions and magnitudes of rotations of permanent maxillary central incisors and first molars in the mixed dentition in repaired complete unilateral cleft lip and palate (UCLP) and study their associations with absence of teeth in their vicinity. MATERIALS AND METHODS Dental casts and orthodontic records taken prior to orthodontic preparation for alveolar bone grafting of 74 children with repaired UCLP (53 male, 21 female; aged 8.9 ± 1.0 years) were studied. Directions and magnitudes of permanent maxillary central incisor and first molar rotations were recorded. Tooth absence was confirmed from longitudinal radiographic records. Incisor and molar rotations were analyzed in relation to the absence of teeth in their vicinity. RESULT Distolabial rotation of the permanent maxillary central incisor was noted in 77.14% on the cleft side, while distopalatal rotation was noted in 82.19% on the noncleft side. Incisor rotation was greater when a permanent tooth was present distal to the cleft side central incisor, in the greater segment. The permanent maxillary first molar showed mesiopalatal rotation, which was greater on the cleft side and when there was absence of one or more teeth in the buccal segment. CONCLUSION Presence and absence of teeth were associated with the severity of incisor and molar rotations in UCLP. Crowding of anterior teeth in the greater segment was associated with a greater magnitude of rotation of the cleft side permanent central incisor. Absence of one or more buccal segment teeth was associated with greater magnitude of rotation of the molar.

Perforation in Submucous Cleft Palate Due to Methotrexate-Induced Mucositis in a Patient With Rheumatoid Arthritis.

Author(s): Nam, Jung Woo

Source: The Journal of craniofacial surgery; May 2018; vol. 29 (no. 3); p. 772-773

Publication Type(s): Journal Article

Abstract:Spontaneous palatal perforation can be rarely developed by several causes, such as tumor, trauma, and infection. This article reports a patient with large mid-palatal perforation after suffering from severe oral mucositis, which occurred about a month after taking methotrexate (MTX) for rheumatoid arthritis. Through computed tomography and clinical examination, this patient was diagnosed with perforation in unrecognized submucous cleft palate (SMCP) due to drug-induced mucositis. After MTX discontinuation, the oral mucositis was almost healed completely in a month, and the hole was successfully closed by palatoplasty. The author can see that the palatal perforation can occur by oral complication of MTX in SMCP patient. It is an important awareness to dentists as the use of MTX continues to increase for antirheumatic therapy.

Dentoalveolar Cleft Treatment Outcome Using Modified Huddart-Bodenham Index and Regression Analysis of Associated Factors.

Author(s): Arshad, Anas Imran; Alam, Mohammad Khursheed; Khamis, Mohammad Fadhli

Source: The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association; May 2018; vol. 55 (no. 5); p. 682-687

Publication Type(s): Journal Article

Abstract:OBJECTIVEThe aim of this study is to assess the treatment outcome of complete unilateral cleft lip and palate (CUCLP) patients using modified Huddart/Bodenham scoring system (MHB). To determine whether there is an association of congenital and postnatal factors with the treatment outcome.DESIGNRetrospective observational study.SETTINGTwo regional cleft-referral centers.MAIN OUTCOME MEASURESIn the current study, 101 pairs of dental models of non-syndromic CUCLP patients were retrieved from hospital archives. Each occlusal relationship from central incisor till the first permanent molars were scored except the lateral incisor. Sum of 10 occlusal relationships in each study sample gave a total occlusion score. The primary outcome was the mean total occlusion score.RESULTSAccording to MHB, a mean (standard deviation) total occlusion score of -8.92 (6.89) was determined. Based on treatment outcome, 66 cases were favorable (grades 1, 2, and 3) and 35 cases were unfavorable (grades 4 and 5). Chi-square tests indicated, difference of cheiloplasty ($P = .001$) and palatoplasty ($P < .001$) statistically significant. Five variables-gender, family history of cleft, cleft side, cheiloplasty, and palatoplasty-were analyzed with a logistic regression model.CONCLUSIONSFinal model indicated that cases treated with modified Millard technique (cheiloplasty) and Veau-Wardill-Kilner method (palatoplasty) had higher odds of unfavorable treatment outcome.

Active Presurgical Infant Orthopedics for Unilateral Cleft Lip and Palate: Intercenter Outcome Comparison of Latham, Modified McNeil, and Nasoalveolar Molding.

Author(s): Kornbluth, Michelle; Campbell, Richard E; Daskalogiannakis, John; Ross, Elizabeth J

Source: The Cleft palate-craniofacial journal : official publication of the American Cleft Palate-Craniofacial Association; May 2018; vol. 55 (no. 5); p. 639-648

Publication Type(s): Journal Article

Abstract:OBJECTIVETo compare dental arch relationship, craniofacial form, and nasolabial aesthetic outcomes among cleft centers using distinct methods of presurgical infant orthopedics (PSIO).DESIGNRetrospective cohort study.SETTINGFour cleft centers in North America.PATIENTSOne hundred ninety-one children with repaired complete unilateral cleft lip and palate (CUCLP).MAIN OUTCOME MEASURESDental arch relationship was assessed using the GOSLON Yardstick. Craniofacial form was assessed by 12 cephalometric measurements. Nasolabial aesthetics were

assessed using the Asher-McDade system. Assessments were performed between 6 and 12 years of age. **RESULT** The center that used no PSIO achieved the most favorable dental arch relationship and maxillomandibular relationship, with a median GOSLON score of 2.3 ($P < .01$) and an ANB angle of 5.1° ($P < .05$). The proportion of children assigned a GOSLON score of 4 or 5, predictive of the need for orthognathic surgery in adolescence, was 16% at the center that used no PSIO and no secondary surgery, compared to 76% at the centers that used the Latham appliance and early secondary lip and nose surgery ($P < .01$). The center that used no PSIO and no secondary surgery achieved significantly less favorable nasolabial aesthetic outcomes than the centers using Latham appliance or nasoalveolar molding (NAM) ($P < .01$). **CONCLUSION** Effects of active PSIO are multifaceted and intertwined with use of revision surgery. In our study, centers using either the Latham appliance combined with early revision surgery or the NAM appliance without revision surgery achieved better nasolabial aesthetic outcomes but worse maxillary growth, compared to a center using no PSIO and secondary surgery.

Pediatric cleft palate patients show a 3- to 5-fold increase in cumulative radiation exposure from dental radiology compared with an age- and gender-matched population: a retrospective cohort study.

Author(s): Jacobs, Reinhilde; Pauwels, Ruben; Scarfe, William C; De Cock, Carl; Dula, Karl;

Source: Clinical oral investigations; May 2018; vol. 22 (no. 4); p. 1783-1793

Publication Type(s): Journal Article

Abstract: **OBJECTIVE** The objective of the study was to compare estimates of pediatric cumulative exposure and lifetime attributable risk (LAR) of radiation-induced cancer from dental radiology between cleft palate (CP) subjects and age- and gender-matched controls (non-CP), with and without orthodontic treatment. **MATERIALS AND METHOD** The radiation exposure frequency of CP subjects and non-CP controls with and without orthodontic treatment was compared for two-dimensional radiography (intra-oral, panoramic and cephalometric radiography), computed tomography (CT), and cone-beam CT (CBCT) using cumulative radiation dose as an estimate. From this dose estimate, the age- and gender-dependent risk for radiation-induced stochastic effects was calculated for each patient group. **RESULT** CP patients received more radiographic examinations than non-CP controls, with the exception of intra-oral radiographs. The cumulative dose to CP patients was considerably higher (1963 μSv at the age of 20 years) than non-CP patients with (597 μSv) and without (383 μSv) orthodontic treatment, primarily due to the higher frequency of CT scanning. Accordingly, CP patients had a three to five times higher LAR than non-CP patients. **CONCLUSION** This study suggests a significantly higher lifetime radiation exposure to CP patients than non-CP controls from dental radiographic procedures. Diagnostic benefits from the use of CT and CBCT in children must be justified and appropriate dose optimization strategies implemented. **CLINICAL RELEVANCE** The present study indicates the need for proper justification and optimization of pediatric exposures in dentistry, with a special focus on high-risk groups.

Cone beam computed tomography imaging of superior semicircular canal morphology: a retrospective comparison of cleft lip/palate patients and normal controls.

Author(s): Altun, Oğuzhan; Duman, Suayip Burak; Bayrakdar, Ibrahim Sevki; Yasa, Yasin;

Source: Acta Odontologica Scandinavica; May 2018; vol. 76 (no. 4); p. 247-252

Publication Type(s): Academic Journal

Abstract: **Objective:** This study evaluated the prevalence and morphological characteristics of the superior semicircular canal (SSCC) in cleft lip and palate (CL/P) patients using cone beam computed tomography (CBCT). **Materials and Methods:** CBCT images of 53 CL/P patients (28 males and 25 females) and a control group of 76 patients (42 males and 34 females) were evaluated.

Retrospectively, 258 temporal bone images from 129 patients were evaluated in terms of SSCC morphology and divided into a normal pattern (0.6-1.7 mm in thickness), a papyraceous pattern (1.8 mm), a pneumatized pattern and dehiscent. The chi-squared test was used to compare differences among semicircular canal dehiscence (SSCD) patterns in the CL/P and control groups; $p \leq .05$ was taken to reflect statistical significance. Results: The characteristics of the SSCC were evaluated on CBCT images in patients with CL/P and controls. In total, 158 (61%) cases were normal (0.6-1.7 mm in thickness), 31 (12%) papyraceous (<0.5 mm), 8 (3%) thick, and 34 (13%) pneumatized. SSCD was observed in 27 (11%) cases. Statistically significant differences between the CL/P and control groups were evident in terms of SSCC morphology ($p < .001$). Conclusions: SSCD should be considered if a CL/P patient exhibits a vestibular system deficiency. Oral and maxillofacial radiologists should pay attention to SSCD when interpreting CBCT images. Future studies should use high-level spatial resolution CBCT to focus on cleft site and SSCC morphology in larger patient populations.

Active Presurgical Infant Orthopedics for Unilateral Cleft Lip and Palate.

Author(s): Kornbluth, Michelle; Campbell, Richard E.; Daskalogiannakis, John; Ross, Elizabeth

JSource: Cleft Palate-Craniofacial Journal; May 2018; vol. 55 (no. 5); p. 639-648

Publication Type(s): Academic Journal

Abstract: Objective: To compare dental arch relationship, craniofacial form, and nasolabial aesthetic outcomes among cleft centers using distinct methods of presurgical infant orthopedics (PSIO). Design: Retrospective cohort study. Setting: Four cleft centers in North America. Patients: One hundred ninety-one children with repaired complete unilateral cleft lip and palate (CUCLP). Main Outcome Measures: Dental arch relationship was assessed using the GOSLON Yardstick. Craniofacial form was assessed by 12 cephalometric measurements. Nasolabial aesthetics were assessed using the Asher-McDade system. Assessments were performed between 6 and 12 years of age. Results: The center that used no PSIO achieved the most favorable dental arch relationship and maxillomandibular relationship, with a median GOSLON score of 2.3 ($P < .01$) and an ANB angle of 5.1° ($P < .05$). The proportion of children assigned a GOSLON score of 4 or 5, predictive of the need for orthognathic surgery in adolescence, was 16% at the center that used no PSIO and no secondary surgery, compared to 76% at the centers that used the Latham appliance and early secondary lip and nose surgery ($P < .01$). The center that used no PSIO and no secondary surgery achieved significantly less favorable nasolabial aesthetic outcomes than the centers using Latham appliance or nasoalveolar molding (NAM) ($P < .01$). Conclusions: Effects of active PSIO are multifaceted and intertwined with use of revision surgery. In our study, centers using either the Latham appliance combined with early revision surgery or the NAM appliance without revision surgery achieved better nasolabial aesthetic outcomes but worse maxillary growth, compared to a center using no PSIO and secondary surgery.

Effect of early correction of nasal septal deformity in unilateral cleft lip and palate on inferior turbinate hypertrophy and nasal patency.

Author(s): Pinto, Valentina; Piccin, Ottavio; Burgio, Luca; Summo, Valeria; Antoniazzi, Elisa;

Source: International journal of pediatric otorhinolaryngology; May 2018; vol. 108 ; p. 190-195

Publication Type(s): Journal Article

Abstract: OBJECTIVES A relatively neglected aspect of cleft lip nasal deformity is the effect of septal deviation and inferior turbinate hypertrophy (ITH) on the functional airway. In particular, ITH in the noncleft side can be especially problematic, because it reduces the healthy nasal area, creating bilateral nasal obstruction that might affect the growth of the maxillofacial skeleton. Although these anatomic and functional changes are documented, few recommendations have been developed

regarding the proper approach to ITH. The aim of the present study was to assess the ITH severity and determine the degree of nasal airway patency in patients who have undergone primary correction of the nasal septum during lip repair compared to patients operated on without primary septal correction.

METHODSThe study population included two groups. One group consisted of twenty unilateral cleft lip palate UCLP patients who have previously undergone primary rhinoseptoplasty as part of their treatment plan. The control group consisted of twenty UCLP patients operated on without rhinoseptal correction. The Nasal Obstructive Symptom Evaluation (NOSE) scale and nasal endoscopy were used to assess nasal obstruction.

RESULTSThe overall untreated group reported severe symptoms across all NOSE scale dimensions more frequently than children who have undergone primary rhinoseptoplasty. The difference was statistically significant for each dimension ($p < 0.05$). The mean NOSE score for group A and group B was 21.4 ± 9.4 and 70.8 ± 17.2 respectively ($p < 0.0001$). In group A turbinate size decreased significantly ($p < 0.05$) compared to pre-operative data. Comparing the two groups a statistically significant difference in turbinate size was observed ($p < 0.0001$).

CONCLUSIONThe results of the present study confirm that there is a significant degree of ITH and nasal airway dysfunction in patients with UCLP. Early septal repositioning during primary cleft lip repair results in a statistically significant reduction in IT size and improvement of nasal patency.

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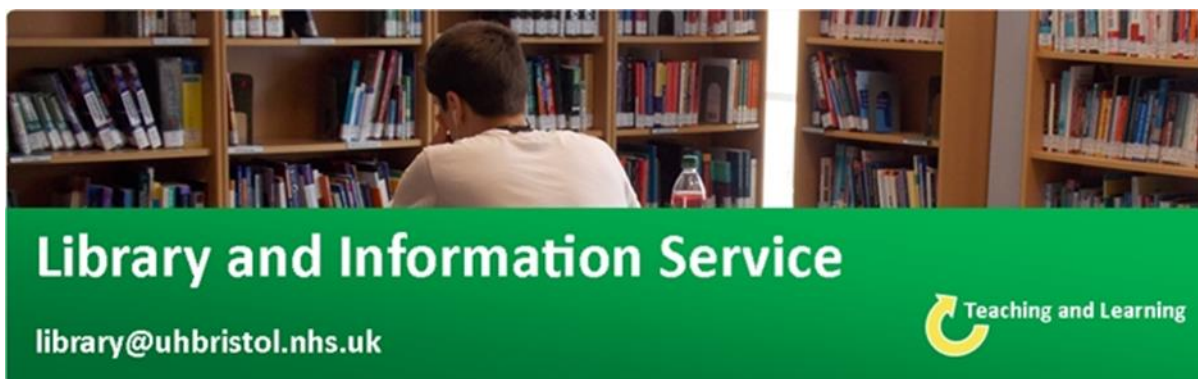
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