

Physiotherapy Outpatients

Current Awareness Newsletter

May 2017

(Quarterly)



Respecting everyone
Embracing change
Recognising success
Working together
Our hospitals.



Training Calendar 2017

All sessions are 1 hour

May (13.00)

Fri 26th **Interpreting Statistics**
Weds 31st **Critical Appraisal**

June (12.00)

Thurs 1st **Literature Searching**
Thurs 8th **Interpreting Statistics**
Tues 13th **Critical Appraisal**
Thurs 29th **Literature Searching**

July (13.00)

Mon 3rd **Interpreting Statistics**
Wed 12th **Critical Appraisal**
Fri 21st **Literature Searching**
Wed 26th **Interpreting Statistics**

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The Latest Evidence

NICE National Institute for
Health and Care Excellence

[Hip fracture in adults](#) May 2017



[Electromechanical-assisted training for walking after stroke](#)

Source: [Cochrane Database of Systematic Reviews](#) - 10 May 2017

...physiotherapy compared to physiotherapy (or usual care) for walking...Setting: inpatient and outpatient setting Intervention: electromechanical...assisted gait training plus physiotherapy Comparison: physiotherapy (or usual care)OutcomesAnticipated...

[Exercise therapy for chronic fatigue syndrome](#)

Source: [Cochrane Database of Systematic Reviews](#) - 25 April 2017 - Publisher: Cochrane Database of Systematic Reviews

A positive effect with respect to sleep, physical function and general health has been observed with exercise in patients with CFS, but no conclusions for outcomes of pain, quality of life, anxiety, depression, drop-out rate and health service resources were

[Oscillating devices for airway clearance in people with cystic fibrosis](#)

Source: [Cochrane Database of Systematic Reviews](#) - 04 May 2017

...compared with conventional physiotherapy for cystic fibrosis Patient...cystic fibrosis Settings: outpatients and hospitalised patients...Comparison: conventional physiotherapy OutcomesIllustrative comparative...devices and conventional physiotherapy in terms of FEV₁ % predicted post...

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Journal Tables of Contents

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[Musculoskeletal Science and Practice](#)

June 2017, Volume 29

[Physiotherapy](#)

June 2017, Volume 103, Issue 2

[BMJ](#)

Current articles

[Spine](#)

May 15 2017, Volume 42, Issue 10

[British Journal of Sports Medicine](#)

May 2017, Volume 51, Issue 10

Exercise: Heterogeneity

Heterogeneity is the extent to which studies brought together in a systematic review demonstrate variation across a range of key variables.

Match the different types of heterogeneity:

1. Statistical heterogeneity (conventionally just known as 'heterogeneity')
 2. Methodological heterogeneity
 3. Clinical heterogeneity
-
- A. Variability in the participants, interventions and outcomes studied
 - B. Variability in study design and risk of bias
 - C. Variability in the intervention effects being evaluated in the different studies

Answers: 1C, 2B, 3A

Current Awareness Database Articles

Below is a selection of articles recently added to the healthcare databases, grouped into the following categories:

Achilles Tendon Rupture
Anterior Cruciate Ligament Repair
Cervical Spine Disc
Shoulder Impingement and Dislocation

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:

library@uhbristol.nhs.uk

1. Cost-minimization Analysis of the Management of Acute Achilles Tendon Rupture.

Author(s): Truntzer, Jeremy N; Triana, Brian; Harris, Alex H S; Baker, Laurence; Chou, Loretta; Kamal, Robin N

Source: The Journal of the American Academy of Orthopaedic Surgeons; Jun 2017; vol. 25 (no. 6); p. 449-457

Publication Date: Jun 2017

Publication Type(s): Journal Article

Abstract:BACKGROUND Outcomes of nonsurgical management of acute Achilles tendon rupture have been demonstrated to be noninferior to those of surgical management. We performed a cost-minimization analysis of surgical and nonsurgical management of acute Achilles tendon rupture. METHODS We used a claims database to identify patients who underwent surgical (n = 1,979) and nonsurgical (n = 3,065) management of acute Achilles tendon rupture and compared overall costs of treatment (surgical procedure, follow-up care, physical therapy, and management of complications). Complication rates were also calculated. Patients were followed for 1 year after injury. RESULTS Average treatment costs in the year after initial diagnosis were higher for patients who underwent initial surgical treatment than for patients who underwent nonsurgical treatment (\$4,292 for surgical treatment versus \$2,432 for nonsurgical treatment; P < 0.001). However, surgical treatment required fewer office visits (4.52 versus 10.98; P < 0.001) and less spending on physical therapy (\$595 versus \$928; P < 0.001). Rates of rerupture requiring subsequent treatment (2.1% versus 2.4%; P = 0.34) and additional costs (\$2,950 versus \$2,515; P = 0.34) were not significantly different regardless whether initial treatment was surgical or nonsurgical. In both cohorts, management of complications contributed to approximately 5% of the total cost. CONCLUSION From the payer's perspective, the overall costs of nonsurgical management of acute Achilles tendon rupture were significantly lower than the overall costs of surgical management. LEVEL OF EVIDENCE III, Economic Decision Analysis.

Database: Medline

2. Neuromechanical Modulation of the Achilles Tendon During Bilateral Hopping in Patients with Unilateral Achilles Tendon Rupture, Over 1 Year After Surgical Repair.

Author(s): Oda, Hiroyuki; Sano, Kanae; Kunimasa, Yoko; Komi, Paavo V; Ishikawa, Masaki

Source: Sports medicine (Auckland, N.Z.); Jun 2017; vol. 47 (no. 6); p. 1221-1230

Publication Date: Jun 2017

Publication Type(s): Journal Article

Abstract:BACKGROUND Patients who have had an Achilles tendon (AT) rupture repaired are potentially at higher risk for re-rupture than those without previous rupture. Little attention has been given to the neuromechanical modulation of muscle-tendon interaction and muscle activation profiles during human dynamic movements after AT rupture repair. OBJECTIVE The purpose of this study was to examine muscle-tendon behavior and muscle activation during bilateral hopping. METHODS We enrolled nine subjects who had undergone surgical repair of unilateral AT rupture within the past 1-2 years. Subjects performed bilateral hopping while we took ultrasound, kinematic, and electromyogram recordings and measurements. AT behaviors were also recorded. We then compared responses between values obtained from the ruptured AT leg (LEGATR) and non-ruptured AT leg (LEGNOR). RESULTS During hopping, the AT stretching amplitudes were greater in the LEGATR than in the LEGNOR, although the peak AT force and stiffness were smaller in the LEGATR than in the LEGNOR. The AT negative mechanical work did not show any significant differences between both legs. However, positive works were significantly lower in the LEGATR than in the LEGNOR. Electromyogram patterns in both soleus and tibialis anterior muscles clearly differed after ground contact for the LEGATR and the LEGNOR. CONCLUSION These results suggest that the repaired ruptured AT can be compliant and have insufficient Young's modulus, which can influence mechanical responses in muscle activities. The modulation of agonist-antagonist muscle activities corresponding to the different levels of stiffness between the LEGATR and the LEGNOR may not be fully functioning during the pre-activation phase.

Database: Medline

3. Ranges of Cervical Intervertebral Disc Deformation During an In Vivo Dynamic Flexion-Extension of the Neck.

Author(s): Yu, Yan; Mao, Haiqing; Li, Jing-Sheng; Tsai, Tsung-Yuan; Cheng, Liming; Wood, Kirkham B; Li, Guoan; Cha, Thomas D

Source: Journal of biomechanical engineering; Jun 2017; vol. 139 (no. 6)

Publication Date: Jun 2017

Publication Type(s): Journal Article

Abstract: While abnormal loading is widely believed to cause cervical spine disc diseases, in vivo cervical disc deformation during dynamic neck motion has not been well delineated. This study investigated the range of cervical disc deformation during an in vivo functional flexion-extension of the neck. Ten asymptomatic human subjects were tested using a combined dual fluoroscopic imaging system (DFIS) and magnetic resonance imaging (MRI)-based three-dimensional (3D) modeling technique. Overall disc deformation was determined using the changes of the space geometry between upper and lower endplates of each intervertebral segment (C3/4, C4/5, C5/6, and C6/7). Five points (anterior, center, posterior, left, and right) of each disc were analyzed to examine the disc deformation distributions. The data indicated that between the functional maximum flexion and extension of the neck, the anterior points of the discs experienced large changes of distraction/compression deformation and shear deformation. The higher level discs experienced higher ranges of disc deformation. No significant difference was found in deformation ranges at posterior points of all the discs. The data indicated that the range of disc deformation is

disc level dependent and the anterior region experienced larger changes of deformation than the center and posterior regions, except for the C6/7 disc. The data obtained from this study could serve as baseline knowledge for the understanding of the cervical spine disc biomechanics and for investigation of the biomechanical etiology of disc diseases. These data could also provide insights for development of motion preservation surgeries for cervical spine.

Database: Medline

4. Division Tenorrhaphy: A Novel Technique for Chronic or Failed Nonoperatively Treated Achilles Tendon Rupture.

Author(s): Doty, Jesse; Katsuura, Yoshihiro; Richardson, Nicholas

Source: Foot & ankle specialist; Jun 2017; vol. 10 (no. 3); p. 242-245

Publication Date: Jun 2017

Publication Type(s): Journal Article

Abstract: Here we describe a modified open technique for the repair of a ruptured Achilles tendon using multiple looped sutures with the creation of interdigitating tendon stumps maximizing surface area for suture application as well as allowing for significant tissue overlay. This technique produces a high strength repair that is useful in cases of extensive degeneration or poor-quality tissue. Degenerative tissue may be encountered with chronic ruptures or failed nonoperative treatment, as well as those ruptures that occur at the proximal myotendinous junction. We present 2 cases in which the technique was utilized: one of a failed nonoperatively treated rupture and another of a chronic rupture. The technique was found to be successful for both patients with improvement in visual analogue scale, Achilles tendon total rupture score, American Orthopaedic Foot and Ankle Score, and Foot and Ankle Disability Index. LEVELS OF EVIDENCE Level IV.

Database: Medline

5. Severe Functional Debilitations After Complications Associated With Acute Achilles Tendon Rupture With 9 Years of Follow-Up.

Author(s): Barfod, Kristoffer Weisskirchner; Sveen, Thor Magnus; Ganestam, Ann; Ebskov, Lars Bo; Troelsen, Anders

Source: The Journal of foot and ankle surgery : official publication of the American College of Foot and Ankle Surgeons; 2017; vol. 56 (no. 3); p. 440-444

Publication Date: 2017

Publication Type(s): Journal Article

Abstract: The purpose of the present study was to investigate the long-term effect of deep infection, sural nerve injury, and repeat rupture in the treatment of acute Achilles tendon rupture. A total of 324 patients had made a claim to the Danish Patient Insurance Association from 1992 to 2010 for a complication after acute Achilles tendon rupture. Of the 324 patients, 119 (36.7%) (77 [64.7%] males and 42 [35.3%] females) returned the Achilles tendon total rupture score and the 36-item short-form survey questionnaires. Patients with deep infection (n = 10), sural nerve injury (n = 10), and repeat rupture (n = 16) participated in a follow-up investigation. The mean follow-up period was 8.9 (range 3 to 21) years. The mean Achilles tendon total rupture score was 49 ± 27 . The summary scores of the physical component and mental components scales of the 36-item Short Form Survey were 43 ± 11 and 52 ± 11 , respectively. No significant differences were found among the subpopulations with deep infection, injury to the sural nerve, or repeat rupture. The physical evaluation investigating tendon length and heel rise work revealed a statistically significant difference between the affected and unaffected limb after repeat rupture (p .05) or deep infection (p > .05). In conclusion, patients

with from a complication after acute Achilles tendon rupture had a remarkable reduction of the Achilles tendon total rupture score and physical component scale score at mean follow-up point of 9 years. Patients with repeat rupture had a significant elongation of the tendon and reduction of strength in the affected limb.

Database: Medline

6. Blood Bupivacaine Concentrations After a Combined Single-Shot Sciatic Block and a Continuous Femoral Nerve Block in Pediatric Patients: A Prospective Observational Study.

Author(s): Suresh, Santhanam; De Oliveira, Gildasio S

Source: Anesthesia and analgesia; May 2017; vol. 124 (no. 5); p. 1591-1593

Publication Date: May 2017

Publication Type(s): Journal Article

Available in full text at [Anesthesia and Analgesia](#) - from Ovid

Abstract:We evaluated blood bupivacaine concentrations in children having a single-shot sciatic and continuous femoral blocks after anterior cruciate ligament repair. Dried blood spot samples were analyzed for bupivacaine levels at 0, 5, 15, 30, 60, and 120 minutes and 4, 24, and 48 hours. The highest 99% upper confidence interval limit was 135 ng/mL at the 4-hour evaluation point. The 99% upper confidence interval was below potentially toxic levels (1500 ng/mL) across all sampling times. The risk of local anesthetic toxicity in pediatric patients receiving single-shot sciatic and continuous femoral nerve blocks is very low.

Database: Medline

7. Microcirculation after Achilles tendon rupture correlates with functional and patient-reported outcomes.

Author(s): Praxitelous, P; Edman, G; Ackermann, P W

Source: Scandinavian journal of medicine & science in sports; Apr 2017

Publication Date: Apr 2017

Publication Type(s): Journal Article

Abstract:Patients with acute Achilles tendon rupture (ATR) display an extended healing process with varying clinical outcome. Poor microcirculatory blood flow has been suggested to be a significant factor for the healing process. However, whether microcirculation may predict healing outcome has been mostly unknown. Therefore, we investigated whether blood flow in the Achilles tendon may be associated with patient-reported and functional outcomes after ATR. In vivo laser-Doppler flowmetry was used to assess microvascular blood flow bilateral in the Achilles tendons, during post-occlusive reactive hyperemia, of nine patients with acute total ATR at 2 weeks post-operatively. At 3 months post-operatively, patient-reported outcome was assessed using Achilles tendon Total Rupture Score (ATRS). At 1 year a uniform outcome score, Achilles Combined Outcome Score (ACOS), was obtained by combining validated, independent, patient-reported (ATRS), and functional outcome (heel-rise test) measures. An improved combined patient-reported and functional outcome, ACOS, at 1 year was significantly correlated with higher maximum blood flow ($r=.777$, $P=.040$) in the injured limb. Furthermore, enhanced patient-reported outcome, ATRS, at 3 months, was associated with an elevated ratio of maximum to resting blood flow ($r=.809$, $P=.015$) in the uninjured limb. Blood flow in early tendon healing is associated with long-term patient-reported and functional outcomes after ATR. The microcirculatory blood flow of both the healing and contralateral Achilles tendon seems to determine the healing potential after injury.

Database: Medline

8. Augmented Versus Nonaugmented Repair of Acute Achilles Tendon Rupture: A Systematic Review and Meta-analysis.

Author(s): Zhang, Yi-Jun; Zhang, Chi; Wang, Quan; Lin, Xiang-Jin

Source: The American journal of sports medicine; Apr 2017 ; p. 363546517702872

Publication Date: Apr 2017

Publication Type(s): Journal Article

Abstract:BACKGROUND Although simple end-to-end repair of the Achilles tendon is common, many augmented repair protocols have been implemented for acute Achilles tendon rupture. However, whether augmented repair is better than nonaugmented repair of an acute Achilles tendon rupture is still unknown. PURPOSE To conduct a meta-analysis to determine whether augmented surgical repair of an acute Achilles tendon rupture improved subjective patient satisfaction without an increase in rerupture rates. Secondary outcomes assessed included infections, ankle range of motion, calf muscle strength, and minor complications. STUDY DESIGN Meta-analysis. METHODS A systematic literature search of peer-reviewed articles was conducted to identify all randomized controlled trials (RCTs) comparing augmented repair and nonaugmented repair for acute Achilles tendon rupture from January 1980 to August 2016 in the electronic databases of PubMed, Web of Science (SCI-E/SSCI/A&HCI), and EMBASE. The keywords (Achilles tendon rupture) AND (surg* OR operat* OR repair* OR augment* OR non-augment* OR end-to-end OR sutur*) were combined, and results were limited to human RCTs and controlled clinical trials published in the English language. Four RCTs involving 169 participants were eligible for inclusion; 83 participants were treated with augmented repair and 86 were treated with nonaugmented repair. RESULTS Augmented repair led to similar responses when compared with nonaugmented repair for acute Achilles tendon rupture (93% vs 90%, respectively; $P = .53$). The rerupture rates showed no significant difference for augmented versus nonaugmented repair (7.2% vs 9.3%, respectively; $P = .69$). No differences in superficial and deep infections occurred in augmented (7 infections) and nonaugmented (8 infections) repair groups during postoperative follow-up ($P = .89$). The average incisional infection rate was 8.4% with augmented repair and 9.3% with nonaugmented repair. No significant differences in other complications were found between augmented (7.2%) and nonaugmented (8.1%) repair ($P = .80$). CONCLUSION Augmented repair, when compared with nonaugmented repair, was not found to improve patient satisfaction or reduce rerupture rate or infection rate. These conclusions are based on 4 trials with small sample sizes, and larger randomized trials are required to confirm these results.

Database: Medline

9. Knee joint kinematics after dynamic intraligamentary stabilization: cadaveric study on a novel anterior cruciate ligament repair technique.

Author(s): Schliemann, Benedikt; Lenschow, Simon; Domnick, Christoph; Herbort, Mirco; Häberli, Janosch; Schulze, Martin; Wähnert, Dirk; Raschke, Michael J; Kösters, Clemens

Source: Knee surgery, sports traumatology, arthroscopy : official journal of the ESSKA; Apr 2017; vol. 25 (no. 4); p. 1184-1190

Publication Date: Apr 2017

Publication Type(s): Journal Article

Abstract: PURPOSE Dynamic intraligamentary stabilization (DIS) has been introduced for the repair of acute anterior cruciate ligament (ACL) tears as an alternative to delayed reconstruction. The aim of the present study was to compare knee joint kinematics after DIS to those of the ACL-intact and ACL-

deficient knee under simulated Lachman/KT-1000 and pivot-shift tests. We hypothesized that DIS provides knee joint kinematics equivalent to an intact ACL. **METHODS** With the use of a robotic knee simulator, knee kinematics were determined in simulated Lachman/KT-1000 and pivot-shift tests at 0°, 15°, 30°, 60°, and 90° of flexion in eight cadaveric knees under the following conditions: (1) intact ACL, (2) ACL deficiency, (3) DIS with a preload of 60 N, and (4) DIS with a preload of 80 N. Statistical analyses were performed using two-factor repeated-measures analysis of variance. The significance level was set at a p value of <0.05. **RESULTS** After DIS with a preload of either 60 N or 80 N, the anterior translation was significantly reduced in the simulated Lachman/KT-1000 and pivot-shift tests when compared to the ACL-deficient knee ($p < 0.05$). No significant differences were observed between the DIS reconstruction with a preload of 80 N and the intact ACL with regard to anterior laxity in either test. However, DIS with a preload of only 60 N was not able to restore knee joint kinematics to that of an intact knee in all degrees of flexion. **CONCLUSION** DIS with a preload of 80 N restores knee joint kinematics comparable to that of an ACL-intact knee and is therefore capable of providing knee joint stability during ACL healing. DIS therefore provides a new technique for primary ACL repair with superior biomechanical properties in comparison with other techniques that have been described previously, although further clinical studies are required to determine its usefulness in clinical settings.

Database: Medline

10. Platelet-rich plasma activates tendon-derived stem cells to promote regeneration of Achilles tendon rupture in rats.

Author(s): Xu, Kang; Al-Ani, Mohanad Kh; Sun, Yanjun; Xu, Wei; Pan, Lianhong; Song, Yang; Xu, ZhiLing; Pan, Xin; Yang, Li

Source: Journal of tissue engineering and regenerative medicine; Apr 2017; vol. 11 (no. 4); p. 1173-1184

Publication Date: Apr 2017

Publication Type(s): Journal Article

Abstract: This study investigates whether platelet-rich plasma (PRP) is an activator of tendon-derived stem cells (TDSCs) to promote regeneration of Achilles tendon post-rupture in rats. In the in vitro study, PRGF (activated PRP) significantly enhanced cell DNA synthesis, improved viability and promoted proliferation, while facilitating cell migration and the recruitment of TDSCs. In addition, TDSCs were mixed with collagen and PRP to form collagen-TDSC constructs (CTC) and PRP-collagen-TDSC constructs (PCTCs). After 3 weeks of culture in vitro, we found that most of the encapsulated TDSCs in the CTCs and PCTCs were still alive, while cells in the PCTCs showed a more aligned arrangement compared to the CTCs. In addition, the micro-structure of PCTC showed more obvious fibre-like tissues and formed a cyclic microvascular structure. The tenocyte-related genes types I and III collagen, Tenascin-C and Scleraxis of TDSCs in the PCTCs and CTCs were upregulated with time, and PCTCs showed more significance than CTCs ($p < 0.05$). After in vivo transplantation, the CTCs and PCTCs showed stimulatory effects on Achilles tendon healing. Moreover, the PCTCs improved the macroscopic appearance, histological morphology and biomechanical strength of ruptured Achilles tendon better than CTC. These results indicate that PRP can activate TDSCs to improve the quality of Achilles tendon rupture healing in the early stages. Copyright © 2015 John Wiley & Sons, Ltd.

Database: Medline

11. Outcomes and complications of percutaneous versus open repair of acute Achilles tendon rupture: A meta-analysis.

Author(s): Yang, Bo; Liu, Yang; Kan, Shunli; Zhang, Di; Xu, Hong; Liu, Feifei; Ning, Guangzhi; Feng, Shiqing

Source: International journal of surgery (London, England); Apr 2017; vol. 40 ; p. 178-186

Publication Date: Apr 2017

Publication Type(s): Journal Article Review

Abstract:BACKGROUND Acute Achilles tendon rupture (AATR) is a frequent injury occurring dominantly in young to middle-aged males. Outcomes and complications between percutaneous and open repair are still controversial. Thus, the purpose of this meta-analysis is to evaluate the outcomes and complications of these two operative methods. MATERIALS AND METHODS We searched multiple databases: PubMed, Web of Science, EMBASE and the Cochrane Library up to October 2016. Two reviewers independently screened the studies for eligibility, evaluated the quality and extracted data from eligible studies, with confirmation by cross-checking. The major results and conclusions were concluded, and the different complication rates and functional outcomes were compared. Meta-analysis was processed by Rev Man 5.3 software. RESULTS Five randomized controlled trials (RCTs) and seven retrospective cohort studies involving 815 patients met the inclusion criteria. The sural nerve injury rate in the percutaneous group was significantly higher (RR = 3.52, 95%CI 1.45 to 8.57, P = 0.006). However, deep infection rate in the open group was higher (RR = 0.33, 95%CI 0.11 to 0.96, P = 0.04) and subgroup analysis of five RCTs showed no significant difference (RR = 0.42, 95%CI 0.09 to 2.10, P = 0.29). No significant difference was seen regarding the rate of re-rupture. The time of operation in the percutaneous group was shorter (RR = -1.99, 95%CI -3.81 to -0.80, P = 0.001). American Orthopedic Foot and Ankle Society (AOFAS) ankle-hindfoot score showed statistically different in the two groups. Other functional outcomes were similar in the two groups. CONCLUSION Percutaneous repair has the advantages of operation time, deep infection and AOFAS score. The functional outcomes were similar in two treatment groups except AOFAS score. Despite the higher incidence of sural nerve injury, we still believe that percutaneous repair is superior to open repair for treating AATR.

Database: Medline

12. Acute Achilles Tendon Rupture: Clinical Evaluation, Conservative Management, and Early Active Rehabilitation.

Author(s): Kauwe, Merrell

Source: Clinics in podiatric medicine and surgery; Apr 2017; vol. 34 (no. 2); p. 229-243

Publication Date: Apr 2017

Publication Type(s): Journal Article Review

Abstract: The Achilles tendon (AT) is the strongest, largest, and most commonly ruptured tendon in the human body. Physical examination provides high sensitivity and specificity. Imaging studies are not recommended unless there are equivocal findings in the physical examination. Recent studies have shown that the risk of re-rupture is negated with implementation of functional rehabilitation protocols. Heterogeneity in study design makes conclusions on the specifics of functional rehabilitation protocols difficult; however, it is clear that early weight bearing and early controlled mobilization lead to better patient outcome and satisfaction in both surgically and conservatively treated populations.

Database: Medline

13. Interlocking horizontal mattress suture versus Kakiuchi technique in repair of Achilles tendon rupture: a biomechanical study.

Author(s): Guzzini, Matteo; Lanzetti, Riccardo Maria; Proietti, Lorenzo; Mazza, Daniele; Fabbri, Mattia; Monaco, Edoardo; Ferri, Germano; Ferretti, Andrea

Source: Journal of orthopaedics and traumatology : official journal of the Italian Society of Orthopaedics and Traumatology; Mar 2017

Publication Date: Mar 2017

Publication Type(s): Journal Article

Available in full text at [Journal of Orthopaedics and Traumatology : Official Journal of the Italian Society of Orthopaedics and Traumatology](#) - from National Library of Medicine

Available in full text at [Journal of Orthopaedics & Traumatology](#) - from EBSCOhost

Abstract:BACKGROUNDIn recent years, the type of surgical treatment for Achilles tendon rupture has been the subject of controversial debate. This biomechanical study evaluates for the first time in literature the ultimate failure load (UFL) of interlocking horizontal mattress (IHM) suture as compared with Kakiuchi suture in Achilles tendon rupture. The hypothesis is that IHM suture can be performed also for Achilles tendon rupture and ensures higher resistance compared with the traditional Kakiuchi suture.MATERIALS AND METHODSTwenty fresh bovine Achilles tendons were obtained. Ten preparations were randomly assigned to each of two different groups: group A (10 specimens) sutured by IHM technique, and group B (10 specimens) sutured by Kakiuchi technique. Each construct was mounted and fixed on a tensile testing machine. Static preconditioning of 50 N was applied for 5 min as initial tensioning to stabilize the mechanical properties of the graft, then a load to failure test was performed at crosshead speed of 500 mm/min.RESULTSTen specimens were tested for each group. The mean UFL was 228.6 ± 98.6 N in the IHM suture group and 96.57 ± 80.1 N in the Kakiuchi suture group. Statistical analysis showed a significant difference ($p < 0.05$) with better UFL in the IHM group. In both groups, the failure mode registered in each specimen was suture breakage (rupture of suture thread).CONCLUSIONSIHM suture achieved better UFL compared with Kakiuchi suture in an animal model of Achilles tendon repair. These results seem to support IHM as a valid option in Achilles tendon rupture.

Database: Medline

14. Primary surgical repair of acute Achilles tendon rupture: comparative results of three surgical techniques.

Author(s): Lonžarić, Dragan; Kruščić, Aleksandar; Dinevski, Dejan; Povalej Bržan, Petra; Jesenšek Papež, Breda

Source: Wiener klinische Wochenschrift; Mar 2017; vol. 129 (no. 5-6); p. 176-185

Publication Date: Mar 2017

Publication Type(s): Journal Article

Abstract:PURPOSETo determine which of the three surgical techniques for acute unilateral complete rupture of Achilles tendons in use at the University Clinical Centre Maribor gives the best short-term functional results.METHODSIn the retrospective analysis of the results of 3 surgical techniques, 262 patients of which 244 (93.1%) were men (mean age 41.6 ± 10.0 years, range 21.5-83.0 years) operated on during the period from 2000 to 2008 were included. Group A (open technique with fascial augmentation) included 42 (16%) patients, group B (original modification of percutaneous suturing according to Čretnik and Kosanović) included 159 (60.7%) patients, and group C (original percutaneous fixation with two embracing and crossed loops according to Kruščić) included 61 (23.3%) patients. The rehabilitation protocol for group C included use of individually manufactured closed ankle functional orthosis, which replaced the plaster cast after 2 weeks of immobilization and permits early ankle range-of-motion exercising and full weight bearing. The functional outcome and incidence of postsurgical complications were analysed from medical records covering the period of

6 months. **RESULTS** Patients from group C achieved the best functional results in the shortest time. The duration of immobilization (5.3 ± 0.1 weeks) and use of crutches (5.3 ± 0.5 weeks) were the shortest. The ability to rise up on toes on the affected leg, to walk on toes and heels, and duration of restriction of physical activities including sports were shorter than in the other two groups ($p < 0.001$ for all variables). Two reruptures were experienced in group B, one in group C, and none in group A. **CONCLUSIONS** Good functional results and a relatively small number of postsurgical complications advocate the use of percutaneous suturing techniques. The best and fastest functional recovery was attained in the group treated with the original technique of percutaneous fixation with two embracing and crossed thread loops according to Kruščić.

Database: Medline

15. How early must an acute Achilles tendon rupture be repaired?

Author(s): Park, Young Hwan; Jeong, Seong Min; Choi, Gi Won; Kim, Hak Jun

Source: Injury; Mar 2017; vol. 48 (no. 3); p. 776-780

Publication Date: Mar 2017

Publication Type(s): Journal Article

Abstract: An acute Achilles tendon rupture is the most common tendon rupture of the lower extremities, yet the optimal timing for an early surgical repair is unclear. To identify the optimal time for an early surgical repair with favorable results, we evaluated the isokinetic muscle strength and clinical outcomes of early surgical repairs of acute Achilles tendon ruptures performed at different time points after injury. Between January 2011 and July 2015, a total of 65 patients underwent an acute Achilles tendon rupture repair within 1 week after injury. To compare the outcomes at different time points post-injury, we divided patients into 3 groups: group 1, surgical treatment at ≤ 24 h; group 2, surgery at ≥ 24 h and ≤ 48 h; and group 3, surgery at ≥ 48 hours and ≤ 1 week. The isokinetic muscle strength in both ankles were measured using a Cybex dynamometer, and the Achilles tendon total rupture score, the modified Tegner scoring system, the visual analog scale was used to assess clinical outcomes. Kruskal-Wallis and Fisher's exact tests were used to compare multiple results in the 3 groups. No significant differences were found among the groups in terms of ankle isokinetic muscle strength or clinical outcome scores ($P > 0.05$). The complication rate was low in all groups. There were no significant differences in isokinetic muscle strength or clinical outcomes following acute Achilles tendon rupture repairs performed within 1 week after injury.

Database: Medline

16. Radiological Parameters of Undegenerated Cervical Vertebral Segments in a Korean Population.

Author(s): Choi, Sung Hoon; Lee, HeeSang; Cho, Jae Hwan; Jung, Jin Il; Lee, Dong-Ho

Source: Clinics in orthopedic surgery; Mar 2017; vol. 9 (no. 1); p. 63-70

Publication Date: Mar 2017

Publication Type(s): Journal Article

Available in full text at [Clinics in Orthopedic Surgery](#) - from EBSCOhost

Available in full text at [Clinics in Orthopedic Surgery](#) - from National Library of Medicine

Abstract: **BACKGROUND** Several scoring systems for cervical disc and facet joint degeneration, using radiography or computed tomography, have been developed and tested for reliability. However, definitions of disc height and facet joint space narrowing vary. To our knowledge, no study has reported quantitative data for normal radiologic values of the cervical spine in the Korean

population. The purpose of this study is to determine normal cervical disc height, disc height ratio, and facet joint space values, and investigate the correlation between demographic data and these values. **METHODS** We performed a retrospective study of patients who underwent artificial disc replacement of the cervical spine. Disc heights and facet joint spaces were measured using cervical neutral lateral radiographs and computed tomography. The means, standard deviations, and 95% confidence intervals of the values were determined. **RESULTS** We measured 148 intervertebral discs and 352 posterior facet joints. The mean disc height measured by plain radiography and computed tomography was 5.57 ± 0.81 mm and 4.94 ± 0.94 mm, respectively. The mean facet joint space values measured by plain radiography and computed tomography were 1.94 ± 0.45 mm and 1.43 ± 0.39 mm, respectively. The disc heights and facet joint space values measured by plain radiography were greater than those measured by computed tomography. The lower limit of the 95% confidence interval of the disc height ratio calculated by plain radiography and computed tomography was greater than 0.94 at all levels except for C5-6. Patient height and disc height showed a tendency of positive correlation. **CONCLUSIONS** In a Korean population, the normal cervical disc height was about 5.0 mm and the normal facet joint space was 1.4 mm. Disc height ratio can reliably identify normal cervical disc height in patients with mild degeneration. Patient height was positively correlated with disc height and facet joint space. Thus, when selecting a cervical implant, surgeons should consider patient height as well as estimated normal disc height.

Database: Medline

17. Factors influencing the success of anterior cruciate ligament repair with dynamic intraligamentary stabilisation.

Author(s): Krismer, Anna M; Gousopoulos, Lampros; Kohl, Sandro; Ateschrang, Atesch; Kohlhof, Hendrik; Ahmad, Sufian S

Source: Knee surgery, sports traumatology, arthroscopy : official journal of the ESSKA; Feb 2017

Publication Date: Feb 2017

Publication Type(s): Journal Article

Abstract: **PURPOSE** Primary repair of the anterior cruciate ligament (ACL) has regained interest of clinicians with recent development of novel repair techniques. Dynamic intraligamentary stabilisation was introduced in an attempt to promote healing by shielding cyclic loads acting upon the ACL during the healing phase. The aim of this study was to identify negative factors likely to influence success of this procedure. **METHODS** Between 2009 and 2014, 264 patients with an acute ACL rupture undergoing dynamic intraligamentary stabilisation were included in this study. Patients were evaluated for anterior/posterior laxity; range of motion and patient reported outcome measures. Adverse events and re-operations were noted. Failure was defined as AP Translation >3 mm, re-rupture or conversion to ACL reconstruction. Minimum follow-up was 24 months. Univariate and multivariate regression models were utilized to determine predictors of failure. **RESULTS** An overall complication rate of 15.1% was noted comprising 9.5% (n = 25) re-ruptures, 4.1% (n = 11) persistent instability, and 1.5% (n = 4) > 10° fixed flexion deformity. Two factors were identified as negative predictors of failure: (1) pursuit of competitive sport activities with a Tegner pre-injury score >7 (Odds Ratio (OR) 4.4, CI 1.2-15.9, p = 0.02) and (2) mid-substance ACL rupture location (OR 2.5, 1.1-5.7, p = 0.02). When neither of those risk factors occurred the failure rate was limited to 3.9%. **CONCLUSIONS** Correct patient selection and narrowing of indications are necessary to maintain high success rates of the procedure. Mid-substance ACL ruptures and a high pre-injury sports activity level are two predictors of inferior outcome. **LEVEL OF EVIDENCE** II.

Database: Medline

18. Chronic Achilles Tendon Rupture Treated with Allograft: A Case Report.

Author(s): Restuccia, Giuseppe; Lippi, Alessandro; Casella, Francesco; Citarelli, Carmine; Sacchetti, Federico; Benifei, Maurizio

Source: Surgical technology international; Feb 2017; vol. 30

Publication Date: Feb 2017

Publication Type(s): Journal Article

Abstract:In clinical practice, chronic Achilles tendon ruptures are uncommon. Usually, these lesions are discovered four to six weeks after injuries. More frequently, Achilles tendon ruptures are acute and treated with tendon sutures.1 Many surgical techniques are available to treat chronic lesions such as sutures or V-Y elongation with or without augments.2-3 Our case is about a chronic Achilles tendon rupture discovered two years after injury. Our patient came to our attention with a 6 cm tendon gap. We performed tendon repair with cadaver allograft. After four years of follow-up, our patient has a complete functional recovery and he can normally perform daily and working tasks without pain.

Database: Medline

19. Management of acute Achilles tendon rupture with tendon-bundle technique.

Author(s): Li, Chun-Guang; Li, Bing; Yang, Yun-Feng

Source: The Journal of international medical research; Feb 2017; vol. 45 (no. 1); p. 310-319

Publication Date: Feb 2017

Publication Type(s): Journal Article

Available in full text at [Journal of International Medical Research](#) - from Highwire Press

Abstract:Objective * These authors contributed equally to this work. To explore tendon-bundle technique for treating Achilles tendon rupture with no defects. Methods Patients with full unilateral Achilles tendon rupture with no defects were included. The Achilles tendon medial edge surgical repair approach was used, revealing horsetail-like rupture bundles. Tendon bundles were anatomically realigned and repaired end-to-end using 5-0 sutures. Patients were followed-up for 1 year, and assessed for differences between the repaired versus healthy limb. Results Out of 24 patients (18 male, 6 female; aged 19-56 years) at 1 year following surgery, mean American Orthopaedic Foot and Ankle Society score was 92.4 ± 5.9 ; mean differences between the surgically repaired versus contralateral side in dorsiflexion and plantarflexion angle were $3.5 \pm 2.3^\circ$ and $5.6 \pm 3.2^\circ$, respectively; mean difference in calf circumference between the two sides was 0.9 ± 0.5 cm; and mean increase in Achilles tendon width versus the healthy side was 0.8 ± 0.2 cm. By 1 year post-surgery, there were no significant between-side differences in dorsiflexion and plantarflexion angle, or calf circumference. Conclusions Tendon-bundle surgery resulted in good ankle function restoration and low complication rates. Tendon-bundle surgery may reduce blood supply destruction and maximally preserve Achilles tendon length, and may be effective for treating Achilles tendon rupture with no defects.

Database: Medline

20. Acute Achilles Tendon Rupture Treated by Double Side-Locking Loop Suture Technique With Early Rehabilitation.

Author(s): Miyamoto, Wataru; Imade, Shinji; Innami, Ken; Kawano, Hirotaka; Takao, Masato

Source: Foot & ankle international; Feb 2017; vol. 38 (no. 2); p. 167-173

Publication Date: Feb 2017

Publication Type(s): Journal Article

Abstract:BACKGROUND Although early accelerated rehabilitation is recommended for the treatment of acute Achilles tendon rupture, most traditional rehabilitation techniques require some type of brace. METHODS We retrospectively analyzed 44 feet of 44 patients (25 male and 19 female) with a mean age of 31.8 years who had an acute Achilles tendon rupture related to athletic activity. Patients had been treated by a double side-locking loop suture (SLLS) technique using double antislip knots between stumps and had undergone early accelerated rehabilitation, including active and passive range of motion exercises on the day following the operation and full weight-bearing at 4 weeks. No brace was applied postoperatively. The evaluation criteria included the American Orthopaedic Foot & Ankle Society Ankle-Hindfoot Scale (AOFAS) score; active plantar flexion and dorsiflexion angles; and the intervals between surgery and the time when patients could walk normally without any support, perform double-leg heel raises, and perform 20 continuous single-leg heel raises of the operated foot. RESULTS Despite postoperative early accelerated rehabilitation, the AOFAS score and active dorsiflexion angles improved over time (6, 12, and 24 weeks and 2 years). A mean of 4.3 ± 0.6 weeks was required for patients to be able to walk normally without any support. The mean period to perform double-leg heel raises and 20 continuous single-leg heel raises of the injured foot was 8.0 ± 1.3 weeks and 10.9 ± 2.1 weeks, respectively. All patients, except one who was engaged in classical ballet, could return to their preinjury level of athletic activities, and the interval between operation and return to athletic activities was 17.1 ± 3.7 weeks. CONCLUSION The double SLLS technique with double antislip knots between stumps adjusted the tension of the sutured Achilles tendon at the ideal ankle position and provided good clinical outcomes following accelerated rehabilitation after surgery without the use of a brace. LEVEL OF EVIDENCE Level IV, retrospective case series.

Database: Medline

21. Persistent stromal fibroblast activation is present in chronic tendinopathy.

Author(s): Dakin, Stephanie G; Buckley, Christopher D; Al-Mossawi, Mohammad Hussein; Hedley, Robert; Martinez, Fernando O; Wheway, Kim; Watkins, Bridget; Carr, Andrew J

Source: Arthritis research & therapy; Jan 2017; vol. 19 (no. 1); p. 16

Publication Date: Jan 2017

Publication Type(s): Journal Article

Available in full text at [Arthritis Research & Therapy](#) - from National Library of Medicine

Available in full text at [Arthritis Research & Therapy](#) - from EBSCOhost

Abstract:BACKGROUND Growing evidence supports a key role for inflammation in the onset and progression of tendinopathy. However, the effect of the inflammatory infiltrate on tendon cells is poorly understood. METHODS We investigated stromal fibroblast activation signatures in tissues and cells from patients with tendinopathy. Diseased tendons were collected from well-phenotyped patient cohorts with supraspinatus tendinopathy before and after sub-acromial decompression treatment. Healthy tendons were collected from patients undergoing shoulder stabilisation or anterior cruciate ligament repair. Stromal fibroblast activation markers including podoplanin (PDPN), CD106 (VCAM-1) and CD248 were investigated by immunostaining, flow cytometry and RT-qPCR. RESULTSPDPN, CD248 and CD106 were increased in diseased compared to healthy tendon tissues. This stromal fibroblast activation signature persisted in tendon biopsies in patients at 2-4 years post treatment. PDPN, CD248 and CD106 were increased in diseased compared to healthy tendon cells. IL-1 β treatment induced PDPN and CD106 but not CD248. IL-1 β treatment induced NF- κ B target genes in healthy cells, which gradually declined following replacement with cytokine-free

medium, whilst PDPN and CD106 remained above pre-stimulated levels. IL-1 β -treated diseased cells had more profound induction of PDPN and CD106 and sustained expression of IL6 and IL8 mRNA compared to IL-1 β -treated healthy cells. CONCLUSIONS We conclude that stromal fibroblast activation markers are increased and persist in diseased compared to healthy tendon tissues and cells. Diseased tendon cells have distinct stromal fibroblast populations. IL-1 β treatment induced persistent stromal fibroblast activation which was more profound in diseased cells. Persistent stromal fibroblast activation may be implicated in the development of chronic inflammation and recurrent tendinopathy. Targeting this stromal fibroblast activation signature is a potential therapeutic strategy.

Database: Medline

22. Arthroscopic anterior cruciate ligament repair for proximal anterior cruciate ligament tears in skeletally immature patients: Surgical technique and preliminary results.

Author(s): Bigoni, Marco; Gaddi, Diego; Gorla, Massimo; Munegato, Daniele; Pungitore, Marco; Piatti, Massimiliano; Turati, Marco

Source: The Knee; Jan 2017; vol. 24 (no. 1); p. 40-48

Publication Date: Jan 2017

Publication Type(s): Journal Article

Available in full text at [Knee, The](#) - from ProQuest

Abstract: BACKGROUND Anterior cruciate ligament (ACL) tears in children are increasingly common and present difficult treatment decisions due to the risk of growth disturbance. Although open primary ACL repair was abandoned in the historical literature, recent studies have suggested that there is a role for arthroscopic primary repair in patients with proximal tears. METHOD This is a retrospective review of five consecutive patients aged 9.2 years (range 8 to 10) who underwent suture anchor ACL reinsertion. Patients were included if they were Tanner stages 1-2 and proximal ACL tears with adequate tissue quality confirmed arthroscopically. The time frame was 81 days. Arthroscopic ACL reinsertion was performed with bioabsorbable suture anchor. Clinical evaluation, KT-1000™, and MRI were re-evaluated. Clinical outcomes were measured using International Knee Documentation Committee (IKDC), Lysholm and Tegner activity score. RESULTS At a mean follow-up of 43.4 months (range 25 to 56), no re-injury and leg length discrepancies were observed. Four patients had negative Lachman tests. The remainder had a grade 1 Lachman test. The mean side-to-side difference was 3 (2-4mm). In MRI obtained at the last follow-up, no articular lesions or growth arrest were observed and the reinserted ACL was recognized in every exam. All patients returned to previous level of activity and presented normal and nearly normal IKDC score. The mean Lysholm score was 93.6. CONCLUSION Arthroscopic ACL repair can achieve good short-term results with joint stability and recovery of sport activity in skeletally immature patients, with proximal ACL avulsion tear.

Database: Medline

23. Knotless Repair of Achilles Tendon Rupture in an Elite Athlete: Return to Competition in 18 Weeks.

Author(s): Byrne, Paul A; Hopper, Graeme P; Wilson, William T; Mackay, Gordon M

Source: The Journal of foot and ankle surgery : official publication of the American College of Foot and Ankle Surgeons; 2017; vol. 56 (no. 1); p. 121-124

Publication Date: 2017

Publication Type(s): Journal Article

Abstract:Rupture of the Achilles tendon is an increasingly common injury, particularly in physically active males, and current evidence favors minimally invasive surgical repair. We describe the case of a 36-year-old male elite bobsled athlete with complete rupture of the Achilles tendon. He was treated with surgical repair of the ruptured tendon using an innovative, minimally invasive procedure based on an internal bracing concept and was able to undergo early mobilization and aggressive physiotherapy rehabilitation. His recovery was such that he returned to training at 13 weeks postoperatively and participated in an international competition at 18 weeks, winning a World Cup silver medal. He subsequently raced at the 2014 Winter Olympic Games at 29 weeks after surgery. At >2 years since his injury, he has experienced no complications or reinjury. This represents an exceptional recovery that far exceeds the standard expected for such injuries. The use of this technique for athletes could enable accelerated return to sporting activity and attainment of their preinjury activity levels.

Database: Medline

24. Gravity Equinus Position to Control the Tendon Length of Reversed Free Tendon Flap Reconstruction for Chronic Achilles Tendon Rupture.

Author(s): Sanada, Takaki; Uchiyama, Eiji

Source: The Journal of foot and ankle surgery : official publication of the American College of Foot and Ankle Surgeons; 2017; vol. 56 (no. 1); p. 37-41

Publication Date: 2017

Publication Type(s): Journal Article

Abstract:Repair of chronic Achilles tendon rupture is a surgical challenge. We describe the use of a free turndown tendon flap augmentation raised from the proximal gastrocnemius aponeurosis. To control optimal tension or the reconstructed Achilles tendon length, we used an original method by referring to the gravity planter flexion ankle angle of the contralateral limb. Key aspects of the technique are described. A retrospective analysis of the short-term outcomes achieved in a case series (n = 56) is presented. The postoperative anthropometric findings are also presented to indicate the successful outcomes achieved with this technique.

Database: Medline

25. Dual Fixation of Calcaneal Tuberosity Avulsion with Concomitant Achilles Tendon Rupture: A Novel Hybrid Technique.

Author(s): Prabhakar, Gautham; Kusnezov, Nicholas; Rensing, Nicholas; Abdelgawad, Amr

Source: Case reports in orthopedics; 2017; vol. 2017 ; p. 9150538

Publication Date: 2017

Publication Type(s): Journal Article

Available in full text at [Case Reports in Orthopedics](#) - from ProQuest

Abstract:Fracture of the calcaneal tuberosity with a concomitant Achilles tendon rupture presents a difficult challenge for the treating surgeon. The ultimate goal of treatment is to restore function of both the gastrocnemius-soleus complex and the Achilles tendon. This particular subset of fractures occurs often in diabetics and elderly patients with osteoporosis making fixation of the displaced fragment rather complex. If the Achilles tendon disruption is only discovered later once the fracture is healed, subsequent management is difficult with surgical treatment being more morbid. While this is a rare injury, the consequences of a missed chronic Achilles tendon disruption are severe with significant dysfunction. It is therefore important to have a high index of suspicion for concomitant

injury and to be prepared for dual fixation. We present a novel hybrid surgical fixation technique, which may be used in this instance.

Database: Medline



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