

Consensus Of The Round Table

Second Edition – Paris 2012

Mr David Loveday MBBS FRCS (Tr&Orth)

Mr. Abhijit Guha MBBS FRCS (Tr&Orth)

Mr. Dishan Singh FRCS(Orth)



Aspects of Orthopaedic Foot & Ankle Surgery

Preface

Most foot and ankle meetings currently adopt a format of a faculty lecturing to delegates with limited time for discussion. When I was approached by Ortho Solutions to help organise a meeting, I felt that a Round Table format where all attendees would review the literature and present their individual experience on a topic with ample time for an informal discussion of the subject could be more conducive to an effective learning experience. My suggestion was well received by my co-course organisers and the company.

The 2nd Round Table meeting was held in Paris in June 2012. Abhijit Guha and David Loveday were responsible for recording opinions and capturing the essence of the debates, many of which resulted in consensus on areas of foot & ankle practice being reached. This booklet collates the literature review and the views of all those who participated. We hope that you will find the consensus views helpful: for example, it was of value to know that

This booklet does not represent Level I evidence derived from prospective randomized controlled trials but represents the compilation of anecdotal reports and small case studies based on the combined experience of 30 delegates. I hope that you will find something of use and relevant to your own practice.

Dishan Singh, MBChB, FRCS, FRCS (Orth)

Consultant Orthopaedic Surgeon

Consensus Of The Round Table

Paris 2012

Mr David Loveday MBBS FRCS (Tr&Orth)

Mr. Abhijit Guha MBBS FRCS (Tr&Orth)

Mr. Dishan Singh FRCS(Orth)



Aspects of Orthopaedic Foot & Ankle Surgery

1. Arthritis Great Toe MTPJ
2. Achilles Tendonopathy
3. DVT chemoprophylaxis in foot and ankle surgery
4. Total Ankle Replacement

Convenors:

Mr. D. Singh,

Mr. P. Cooke,

Mr. N. Geary,

Mr. A. Robinson

Hosts: Orthosolutions

Distilled in this document are the thoughts and opinions with consensus where possible of 30 Orthopaedic Foot and Ankle Consultant Surgeons who gathered from across the United Kingdom and France. Though eminence rather than true evidenced based medicine this represents the concepts of over 200 years of combined experience. A basis of invited lectures introduced open and frank discussion from which consensus was sought. The statements herein only represent those of individuals and no claim is made that they are irrefutable. All The percentage figures quoted represent the proportion of the surgeons present who voted on the subject in discussion.

Consensus session 1

Arthritis Great Toe MTPJ

First MTP Joint OA

Manipulation and injection of the joint was discussed and the lack of evidence was pointed out.

There is a single paper on the topic¹ focusing on the outcome following manipulation of the 1st MTPJ under GA and injection of 40mg of Depomedrone and 0.5% Marcaine. 37 joints were followed up for 41 months. The findings were that in Grade 1 disease, it offered pain relief for an average period of 6 months while 1/3rd of the patients required further surgery. In Grade 2 disease, 2/3rd of the patients went on to require further surgery. The conclusion from the paper was that MUA and injection worked in Grade 1 and 2 OA but not in Grade 3.

Anecdotal indications for use included:

- 1) Stiffness of the toe following stubbing injury
- 2) Stiffness post Cheilectomy or Scarf
- 3) Stiffness after Weil's osteotomy

The contralateral joint is often manipulated while one MTP joint is being operated on. 1 in 10 patients retain an improvement in ROM. However, in the presence of a dorsolateral osteophyte, there is no role for a manipulation. The lack of literature on the effect of visco-supplementation of the joint was thereafter discussed. There is a single paper from New Zealand in the Annals of Rheumatology comparing Hylan with Saline in 151 patients with no difference at all.

In summary, there is no good evidence on MUA and injection of the 1st MTP joint and on viscosupplementation. There is none at all on steroid injection while it is proposed that in the future, MUA may be useful in stiffness following MIS cheilectomy.

Further caveats:

1. Injection without manipulation gives good results as well.
2. Local anaesthetic works if it is instilled for longer than a minute
3. Ankle block may be used to ease post operative pain
4. Injection under X Ray control unnecessary (Consensus 90%)

Consensus:

Voting on use of MUA and Injection in different grades of OA:

- Grade 3 0/26 (0%)
- Grade 2 10/26 (39%)
- Grade 1 18/26 (69%)

References:

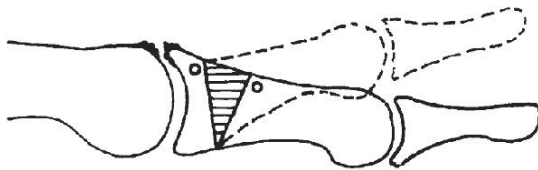
1. Solan MC, Calder JD, Bendall SP. Manipulation and injection for hallux rigidus. Is it worthwhile? J Bone Joint Surg Br. 2001 Jul;83(5):706-8.

Moberg and Akin osteotomy

Erik Moberg published his paper¹ on proximal phalangeal osteotomy in only eight adult patients with Hallux Rigidus. The same procedure had been described before Moberg by Bonney and Macnab² and Kessel and Bonney published their series of 10 adolescent and one adult cases who had the same osteotomy³. Hence it was argued that the procedure should ideally be renamed as Bonney / Kessel osteotomy.

Neil and Citron published good long term results from the procedure with 9 out of 10 toes doing well 22 years after the osteotomy. 5 were symptom free, 4 had no restriction of walking and only one needed a MTP joint fusion⁴.

Moberg's original diagram



The osteotomy changes the arc of movement at the first MTP joint to a more functional range, allowing more dorsiflexion at the expense of plantar flexion.

Indications:

Hallux flexus with at least 20 – 30 degree arc of movement present.

Also indicated in adolescents.

Useful along with dorsal cheilectomy as an additional procedure. Thomas and Smith reported 96% satisfaction after cheilectomy with Moberg osteotomy in 17 adult patients⁵.

Biplanar osteotomy incorporating a dorsal and medial based wedge (Moberg + Akin) has been recommended by Robert Anderson's group in Hallux rigidus with hallux valgus deformity.

Rehabilitation after Moberg osteotomy is fairly quick with mobilization in a flat shoe for 2 weeks and normal footwear thereafter.

Consensus:

There was 53% consensus on use of Moberg osteotomy with a dorsal cheilectomy while only 15% used a Moberg with an Akin procedure. There was 0% consensus for using a Moberg osteotomy on its own.

- | | |
|----------------------------------|-------------|
| • Moberg alone | 0/34 (0%) |
| • Moberg & cheilectomy sometimes | 18/34 (53%) |
| • Moberg & Cheilectomy always | 2/34 (5.9%) |
| • Moberg, Akin & Cheilectomy | 5/34 (15%) |

References:

1. Moberg E, A simple operation for hallux rigidus, Clin Orthop Relat Res. 1979 Jul-Aug;(142):55-6.
2. Bonney G. and MacNab I.: Hallux valgus and Hallux rigidus, J. Bone Joint Surg. 34B:366, 1952.
3. Kessel, L. and Bonney, G.: Hallux rigidus in the adolescent, J. Bone Joint Surg. 40B: 668, 1958.
4. Citron N, Neil M Dorsal wedge osteotomy of the proximal phalanx for hallux rigidus. Long-term results. J Bone Joint Surg Br. 1987 Nov;69(5):835-7.
5. Thomas PJ, Smith RW Proximal phalanx osteotomy for the surgical treatment of hallux rigidus. Foot Ankle Int. 1999 Jan;20(1):3-12.

Cheilectomy

Hatstrup and Johnson Classification (1988)

Grade 1: mild to moderate osteophytes, good joint space preservation.

Grade 2: moderate osteophyte, joint space narrowing, subchondral sclerosis.

Grade 3: marked osteophyte, loss of the visible joint space, with or without subchondral cyst formation.

TABLE 1 Clinical-Radiographic System for Grading Hallux Rigidus			
Grade	Dorsiflexion	Radiographic Findings*	Clinical Findings
0	40° to 50° and/or 10% to 20% loss compared with normal side	Normal	No pain; only stiffness and loss of motion on examination
1	30° to 40° and/or 20% to 50% loss compared with normal side	Dorsal osteophyte is main finding, minimal joint space narrowing, minimal periarticular sclerosis, minimal flattening of metatarsal head	Mild or occasional pain and stiffness, pain at extremes of dorsiflexion and/or plantar flexion on examination
2	10° to 30° and/or 50% to 75% loss compared with normal side	Dorsal, lateral, and possibly medial osteophytes giving flattened appearance to metatarsal head, no more than 1/4 of dorsal joint space involved on lateral radiograph, mild-to-moderate joint-space narrowing and sclerosis, sesamoids not usually involved	Moderate-to-severe pain and stiffness that may be constant; pain occurs just before maximum dorsiflexion and maximum plantar flexion on examination
3	≤10° and/or 75% to 100% loss compared with normal side. There is notable loss of metatarsophalangeal plantar flexion as well (often ≤10° of plantar flexion)	Same as in Grade 2 but with substantial narrowing, possibly periarticular cystic changes, more than 1/4 of dorsal joint space involved on lateral radiograph, sesamoids enlarged and/or cystic and/or irregular	Nearly constant pain and substantial stiffness at extremes of range of motion but not at mid range
4	Same as in Grade 3	Same as in Grade 3	Same criteria as Grade 3 BUT there is definite pain at mid-range of passive motion

*Weight-bearing and anteroposterior and lateral radiographs are used.

Cheilectomy is recommended for Grade 1 and 2 changes in the metatarsophalangeal joint¹.

It is commonly performed through a dorsal approach. The dorsal osteophytes on the metatarsal head are excised along with approximately 30% of the metatarsal head articular surface. The osteophytes from the base of the proximal phalanx are then excised, ensuring at least 70 degrees of dorsiflexion.

In Grade 1 / 2, success rates have been as high as 72-100%, with Coughlin reporting 97% success.

MIS Cheilectomy:

Mr Fred Robinson presented his personal experience with 29 feet in 25 patients, followed up for an average of 12 months. There were 17 females with average age 50 years. 25 / 29 were satisfied but 4 were unhappy. These 4 patients had Grade 3 changes present in the joint. There were two wounds which were slow to heal and one neuropraxia which spontaneously resolved. There was no

heterotopic ossification observed.

Consensus:

There was consensus that MIS had a definite role in cheilectomy but not in Akin or Moberg osteotomy.

- MIS Cheilectomy 6/34 (17.6%)
(of these half use a tourniquet)
- MIS Cheilectomy and arthroscopy 1/34 (2.94%)

Case Scenario : 30 year old male, weekend runner (2-3 miles) with pain on every day walking. Loss of dorsiflexion at MTPJ but retaining 30 degrees of plantar flexion, with Grade 2/3 changes on radiographs. Consensus on:

injection	20%,
cheilectomy	50%
cheilectomy with Moberg osteotomy	30%.

References:

1. Hattrup SJ, Johnson KA Clin Orthop Relat Res. 1988 Jan;(226):182-91. Subjective results of hallux rigidus following treatment with cheilectomy.

Fusion of first metatarsophalangeal joint

Normal ROM at the 1st MTP joint is 40 – 100 degrees of DF and 3 – 43 degrees of PF. Normally 5 – 20 degrees of varus /valgus movement possible. This is more in joints which are spherical in orientation.

Fusion of the first metatarsophalangeal joint was described by Clutton in 1894. It was popularized by McKeever¹. Riggs and Johnson reported excellent results from a 15 year follow up study of 309 cases (234 patients) of 1st MTPJ fusion for painful deformities of the hallux. 206 patients were available for review. 92% were pain free and 98% were able to wear dress shoes of their choosing. Complications (failure of metalwork, recurrent deformity, infection) occurred in 8%².

Ideal position of the toe following fusion: 15 – 20 degrees of dorsiflexion

5 – 10 degrees of valgus

Neutral rotation to match other toes

Pulp to ground angle important in mobilizing, determines the degree of heel elevation possible after surgery. A Dutch study has however shown that there is no significant correlation between foot function and hallux position following 1st MTPJ fusion³.

Contraindications:

1. Smoker / Peripheral ischaemia
2. Limited dorsiflexion at ankle or hallux interphalangeal joint level⁴.

Procedure:

Approach - Medial / dorsal / arthroscopic

Joint surface preparation - Flat / Tongue and trough / Cup and cone (Flat cuts are more stable and require less hardware, usually single screw; Cup and cone cuts leads to shortening and require more hardware)

Fixation – Compression staples / Screws / Plates (Compact foot plates or precontoured plates producing reproducible pulp to floor distance)

Postoperative care:

Mobilise early in heel weight bearing shoes

Complications:

Wound infection 3-6%

Nonunion – 10% (Females 2.4%, Males 19% ; previous hallux surgery 24%)

7 / 11 patients with nonunion were happy after simple removal of metalwork, with function scores only marginally lower than those with successful fusion but 4 required further revision surgery – fusion or replacement⁵.

Sequelae:

Radiological evidence of Hallux IP joint OA has been reported in 65% of patients after 4 years but most are asymptomatic. (Arthrodesis of the first metatarsophalangeal joint for hallux valgus in rheumatoid arthritis. Mann RA, Thompson FM, J Bone Joint Surg Am. 1984 Jun;66(5):687-92)

Overall longterm satisfaction following MTPJ fusion is 85%.

Consensus:

All surgeons present performed 1st MTPJ fusion (100%)

Bilateral simultaneous surgery was preferred by 82% while 18% preferred to operate on one side at time.

Consensus voting:

- | | |
|--|------------|
| • Never do a fusion female or male | 0 |
| • Never do a fusion female | 0 |
| • Rarely do a fusion in female | 2/34 (5%) |
| • Do not do simultaneous bilateral fusions | 6/34 (18%) |
| • Use a dorsomedial incision | 0 |

References:

1. McKeever DC. Arthrodesis of the first metatarsophalangeal joint for hallux valgus, hallux rigidus, and metatarsus primus varus. J Bone Joint Surg Am. 1952 Jan;34-A(1):129-34.
2. Riggs SA Jr, Johnson EW Jr. McKeever arthrodesis for the painful hallux. Foot Ankle. 1983 Mar-Apr;3(5):248-53.
3. van Doeselaar DJ, Heesterbeek PJ, Louwerens JW, Swierstra BA. Foot function after fusion of the

first metatarsophalangeal joint. *Foot Ankle Int.* 2010 Aug;31(8):670-5.

4. Groulier P, Curvale G, Piclet-Legre B, Kelberine F. Arthrodesis of the first metatarsophalangeal joint. *Rev Chir Orthop Reparatrice Appar Mot.* 1994;80(5):436-44.

5. Hope M, Savva N, Whitehouse S, Elliot R, Saxby TS. Is it necessary to re-fuse a non-union of a Hallux metatarsophalangeal joint arthrodesis? *Foot Ankle Int.* 2010 Aug;31(8):662-9.

Silastic implants in MTP joint arthritis

Why have stiffness when you can leave movement and relieve pain?

Swanson's first silastic implant for use in Hallux rigidus was a silastic hemiarthroplasty performed in 1965. Subsequently in 1974, high performance silicone elastomer was developed and thereafter, in 1975, the double stem Swanson flexible hinge arthroplasty was introduced. This was followed by Titanium grommets in 1985.

Tim Clough presented an impassioned argument in favour of silastic implants. He pointed out that the bad press which silicone implants have had, related mainly to the single stem 'hemiarthroplasty' implant and that the double stem flexible hinge implant appeared to perform much better.

Swanson¹ and Sethu² reported 88% and 80% good results in Hallux rigidus respectively with better results in Hallux rigidus than in Hallux valgus and cases with Rheumatoid disease.

Since 1980 however, there have been multiple papers quoting unacceptably high failure rates due to silastic breakdown, synovitis, bone erosion, loosening and implant failure³⁻⁷. Thereafter, the use of silicone hemiarthroplasty was not recommended.

Review of the literature from 1990 onwards brings to light multiple papers about the hinged double stem silastic implant⁸⁻¹². These papers report 87 – 89% satisfaction rate with minimal synovitis and implant failure. There are clinically asymptomatic cysts present in 10 – 40% and results are poorer in Hallux valgus due to recurrence. The titanium grommets may reduce marginal bony overgrowth and implant wear.

The Wrightington experience in 129 toes (106 patients), with a minimum follow-up of 9 years revealed a 95.3 % survival rate, an average AOFAS score of 77 and average active ROM of 30 degrees. 1/3 rd of the patients did have some radiographic evidence of bone resorption but this was not clinically relevant. There was no evidence of loosening and sinkage of the prosthesis. They recommended the use of the silastic double stemmed hinged prosthesis.

Consensus voting:

- | | |
|---|--------------|
| • Silastic implant used in their career | 9/34 (26.5%) |
| • Silastic implant used currently | 6/34 (17.6%) |
| • Implant used other than silastic | 7/34 (20.6%) |

References:

1. Swanson et al Silicone implant arthroplasty of the great toe. A review of single stem and flexible hinge implants. *Clinical Orthop Relat Res* 142; 30-43, 1979.
2. Sethu A, D'Netto DC, Ramakrishna B. Swanson's silastic implants in great toes. *J Bone Joint Surg Br.* 1980 Feb;62-B(1):83-5.
3. Shereff MJ, Jahss MH. Complications of silastic implant arthroplasty in the hallux. *Foot Ankle.* 1980 Sep;1(2):95-101.
4. Worsing RA Jr, Engber WD, Lange TA. Reactive synovitis from particulate silastic. *J Bone Joint Surg Am.* 1982 Apr;64(4):581-5.
5. Verhaar J, Bulstra S, Walenkamp G. Silicone arthroplasty for hallux rigidus. Implant wear and osteolysis. *Acta Orthop Scand.* 1989 Feb;60(1):30-3.
6. Shankar NS. Silastic single-stem implants in the treatment of hallux rigidus. *Foot Ankle Int.* 1995 Aug;16(8):487-91.
7. Rahman H, Fagg PS. Silicone granulomatous reactions after first metatarsophalangeal hemiarthroplasty. *J Bone Joint Surg Br.* 1993 Jul;75(4):637-9.
8. Laird L. Silastic joint arthroplasty of the great toe. A review of 228 implants using the double-stemmed implant. *Clin Orthop Relat Res.* 1990 Jun;(255):268-72.
9. Shankar NS, Asaad SS, Craxford AD. Hinged silastic implants of the great toe. *Clin Orthop Relat Res.* 1991 Nov;(272):227-34.
10. Cracchiolo A 3rd, Weltmer JB Jr, Lian G, Dalseth T, Dorey F. Arthroplasty of the first metatarsophalangeal joint with a double-stem silicone implant. Results in patients who have degenerative joint disease failure of previous operations, or rheumatoid arthritis. *J Bone Joint Surg Am.* 1992 Apr;74(4):552-63.
11. Moeckel BH, Sculco TP, Alexiades MM, Dossick PH, Inglis AE, Ranawat CS. The double-stemmed silicone-rubber implant for rheumatoid arthritis of the first metatarsophalangeal joint. Long-term results. *J Bone Joint Surg Am.* 1992 Apr;74(4):564-70.
12. Sebold EJ, Cracchiolo A 3rd. Use of titanium grommets in silicone implant arthroplasty of the hallux metatarsophalangeal joint. *Foot Ankle Int.* 1996 Mar;17(3):145-51.

Hallux MTP Joint Replacement

Fusion of the 1st MTP joint remains the gold standard in management of Hallux rigidus. MTPJ replacement is still in evolution and there are no absolute indications for the procedure. Relative indications include Hallux rigidus with stiffness / arthritis of the neighbouring joints and to allow for wearing of high heels.

The metatarsal head is flattened dorsally and this results in dorsal impingement and wear of the joint surface. This may cause secondary elevation of the metatarsal. Dorsal impingement and synovitis accounts for the pain.

The proposed biomechanical basis behind failure of previous designs of MTPJ replacement was discussed. The loading of the stem of the MT head prosthesis is eccentric and thus cannot be relied on to assist the bonding to bone. The eccentric dorsal loading forces cause the MTP joint to function as a double hinge. During MTPJ dorsiflexion at toe-off, the proximal phalanx acts as the fixed arm while the metatarsal is the mobile loading arm of the hinge. The EHL aids initial ground clearance and once the toe is dorsiflexed, the plantar fascia and FHL combine to provide the power to push off. Eccentric loading causes bone lysis and shear at the implant interface and this accounts for the failure of cemented stems in previous designs. The presence of rotational forces on the big toe also compounds the problem of implant fixation. The initial stability of the implant should be robust enough to resist angular and rotational forces before bone ingrowth occurs. The presence of a plantar tether results in abnormal dorsiflexion after cheilectomy with hinging back of the proximal phalanx. Therefore, an anatomical MTPJ prosthesis in the presence of the tether would reproduce the dorsal bony block. Release of the FHB, the plantar plate and the sesamoid phalangeal ligaments would help to unhitch the sesamoids and free the plantar tether. Preservation of bone stock with the use of the small threaded stems appears to work as early results suggest less loosening. The present design of the Hyperfix incorporates blunt thread edges to increase contact in soft bone, large diameter thread distally to compact the cancellous bone radially on application and flat thread surface distally to increase resistance to cut out. The stem is grit blasted to increase interference fit and ingrowth and the cutting jig allows cheilectomy to be undertaken with resection of the dorsal 1/5th of the head along with the osteophytes. The implant incorporates a dual curvature with the increased curvature of the dorsum allowing proximal phalangeal tilt back and thus increased dorsiflexion. The undersurface of the implant is titanium porous coated to encourage ingrowth and the recommendation is to sink the implant 1-3 mm from the surface of the metatarsal head. A

Moberg osteotomy may be added if further dorsiflexion is required. In the post operative period, full weight bearing is allowed in a flat shoe and a hyperextension brace is worn for 2 weeks and at night for the next 3 months.

Consensus Session 2

Achilles Tendinopathy

Achilles tendinopathy is an increasingly common pathology. Often just a clinical diagnosis, confirmation can be sought from ultrasound or MRI. Two distinct subclasses exist with Non-insertional (true) Achilles tendonopathy and the enthesis related Insertional Achilles tendonopathy. Imaging allows the site of the abnormal tendon to be identified more accurately. The term Tendinopathy, whilst a generic descriptive one accurately reflects the clinical diagnosis as it is only after histopathology analysis the terms tendinosis, tendinitis or enthesitis can be used.

Non operative management:

There was **consensus** (100%) in using non operative management as the first line of treatment.

- There was **consensus** (100%) on the use of an eccentric physiotherapy programme.
- There was **consensus** (100%) on NOT using intrasubstance steroid injections
- There was division of opinion (51%) on the use of a resting cast
- There was division of opinion (55%) on the use of extracorporeal shockwave therapy. It is proposed to have a mechanical effect by pressure waves affecting different density tissues and also a transient analgesic effect on the afferent nerves
 - 46% recommended after 12 weeks of symptoms
 - 9% recommended before 12 weeks of symptoms
 - 34% had shockwave treatment available on the NHS
- Just 42% recommended the uses of orthoses
 - 20% are 'off the shelf' orthoses
 - 11% are custom orthoses
 - 11% are heel lifts
- A significant minority (31%) recommended stopping running

A number of other treatment modalities were motioned with a more sporadic and anecdotal experience. These included:

- night splints,
- glycerol trinitrate patches,
- high volume injection,
- Platelet Rich Plasma injections
- stem cell injections,
- sclerosing injections to reduce neovascularisation
- Topaz (radiofrequency coblation)

Operative management of non-insertional Achilles tendinopathy:

There was **consensus** (100%) on the use of either ultrasound or MRI imaging prior to any surgery. Identifying the boundary between normal and abnormal tissue is difficult and imaging aids this. Imaging also helps to determine between tendon or peritendon pathology.

Achilles debridement:

- There was **consensus** (65%) on open debridement of non-insertional Achilles tendinopathy. A minority (20%) resected plantaris.
- A cadaveric biomechanical study presented (Kolodziej) proposed that as much as 50% of the cross sectional area of the achilles can be excised without undue risk of rupture.
- ❑ There was **consensus** (100%) on using a paramedian incision approach to the Achilles tendon.
- Open, minimally invasive and endoscopic techniques were all endorsed.

Tendon transfer:

- The indications for a tendon transfer reconstructive technique are listed
 - non operative management failure
 - greater than 50% abnormal tendon
 - Primary debridement failure
 - delayed presentation of Achilles tendon rupture
 - defunctioned tendon (usually a healed elongated tendon).
- There are many tendons used but no evidence over which to use
 - FHL (the commonest)
 - FDL
 - peroneus brevis
 - plantaris
 - turn down gastrocnemius flap
 - hamstring and allograft..
- There was **consensus** (100%) on tendon transfer surgery including a debridement of the Achilles with excision of the degenerate section.
- There was division of opinion (54%) on the tendon transfer passing through the distal Achilles tendon stump and calcaneum and passing back up to the proximal Achilles tendon stump.
- A minority (34%) anchored the tendon transfer directly into the calcaneum.
- A minority (11%) wove the tendon transfer through the distal Achilles tendon stump only.

Insertional Achilles tendonopathy

Non-operative management:

There was **consensus** (100%) on the use of non-operative therapies as initial treatment.

The modalities used matched those of non-insertional pathology as fore-mentioned.

There was however division of opinion (50%) on the use of extracorporeal shockwave therapy for insertional tendinopathy.

Operative management:

There was **consensus** (100%) on offering surgery after failure of non-operative treatment.

The surgical options can be thought of as either a direct or indirect approach to the pathology.

Direct approach: Haglund resection & tendon debridement.

There was **consensus** (76%) on using this surgical treatment.

Various papers have attempted to define a Haglund deformity but there is no gold standard in the measurements of radiographs.

Haglund reported on several types of posterior calcaneal bursitis and the surgical treatment in 1928. The definition of a Haglund deformity and its relevance is not clear. But three factors are involved; the achilles tendon, the retrocalcaneal bursa and a prominence of calcaneal bone.

Haglund resection:

- There was division on the technique undertaken.
 - Excision of the calcaneal prominence and tendon debridement (54%)
 - Excision of the calcaneal prominence only (46%).
 - Open and endoscopic techniques are reported for excision of the calcaneal prominence.
- There was **consensus** (66%) on using an open approach.
- There was **consensus** (60%) on using a midline tendon splitting approach. The minority (40%) using a lateral approach.

Indirect approach: Calcaneal Osteotomy:

- A minority (24%) used this surgical treatment.
- The indirect surgical approach is a dorsally based closing wedge calcaneal osteotomy from either a medial or lateral approach. The osteotomy was first described by Zadek in 1939 and again by Keck and Kelly in 1965.

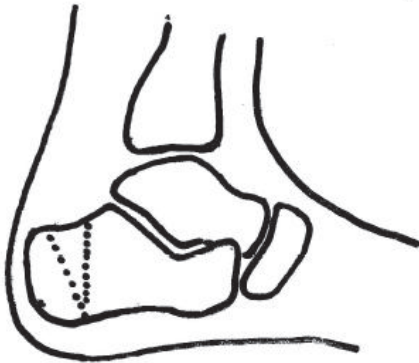


Figure 1. Pre-operative planning of calcaneal osteotomy with dotted line



Figure 2. Post-operative diagram after a "Zadek" calcaneal osteotomy

A recent systematic review states the evaluation of all operative interventions in this area is mainly retrospective and remains inconclusive (Kearney). Further trials and gold standard in this area are very much needed.

References:

Kolodziej P, Glisson RR, Nunley JA. Risk of avulsion of the Achilles tendon after partial excision for treatment of insertional tendonitis and Haglund's deformity: a biomechanical study. Foot Ankle Int 1999; 20(7); 433-7

Kearney R, Costa ML. Insertional Achilles tendinopathy management: a systematic review. Foot Ankle Int 2010; 31(80); 689-94

Haglund P. Beitrag zur Klinik der Achillessehne. Zeitschr Orthop Chir 1928: 49-58

Zadek I. An operation for the cure of achillobursitis. Am J Surg 1939: 43; 542-46

Keck SW, Kelly PJ. Bursitis of the posterior part of the heel. J Bone Joint Surg 1965: 47- A; 267-73

Achilles Tendon Ruptures

There was a discussion on the management of Achilles tendon rupture.

- ☐ There was **consensus** (100%) on diagnosis by clinical examination
- ☐ A minority (14%) always confirmed the diagnosis with an ultrasound scan
- ☐ There was **consensus** (100%) on surgical treatment in elite athletes
- ☐ There was **consensus** (80%) on surgical treatment in a 32 year old male recreational athlete
- ☐ There was **consensus** (90%) on surgical treatment in a 35 year old fit patient presenting 4 days after injury
- There was **consensus** (80%) of opinion that surgical treatment in their hands resulted in an infection risk lower than 2%
- There was **consensus** (85%) on **NOT** offering surgical treatment in an ex-athlete
- There was **consensus** (100%) on **NOT** offering surgical treatment in a low demand patient with comorbidities
- There was **consensus** (80%) on surgical treatment on a colleague

Do we Need to use DVT Chemoprophylaxis in Foot and Ankle Surgery?

Venous Thromboembolism (VTE) in Foot & Ankle surgery:

A systematic review of the current literature was presented by Jit Mangwani on the evidence for thromboprophylaxis in foot and ankle surgery and thereafter, Fred Robinson presented an update on the current status of VTE prophylaxis.

They presented the fact that there was currently an abundance of literature regarding VTE in hip and knee arthroplasty and this has been often extrapolated to foot and ankle surgery as well. However, the incidence of VTE in foot and ankle is significantly less. They also highlighted the lack of supportive evidence in the literature for any form of thrombo prophylaxis following elective foot and ankle surgery.

The NICE guidelines, in January 2010, suggested consideration of LMWH (or UFH) in patients at risk of VTE having lower limb cast immobilization, after evaluating risks and benefits and based on clinical discussion with patient. They advised the prophylaxis to continue until the plaster cast was removed.

BOFAS guidelines for VTE, in April 2010, stated: “The final decision regarding the use, and the method of prophylaxis adopted should follow a risk assessment for VTE and bleeding (preferably at the preoperative assessment clinic) with a discussion usually at the point of consent between the treating surgeon and patient about the pros and cons of this management in each individual”.

Incidence of DVT in the general population is about 0.076%¹ whereas in elective F&A surgery, incidence of symptomatic DVT is reported to be 0-4% and non fatal PE 0.15%. In the trauma situation, the incidence of asymptomatic DVT in conservatively managed ankle fractures is reported to be 5%² while in minor leg injuries requiring plaster cast, the incidence was 3.9%³. The risk of DVT following surgical management of ankle fractures is however reported to be higher, ranging from 0.12%⁴ to 28%⁵. In both of these papers, however, there was no significant reduction in VTE with thromboprophylaxis. The incidence of PE following ORIF of foot fractures is reported to be 0.27%⁶.

The recent paper by Pelet et al⁷, reviewed 2478 patients who had ankle fracture fixation and found

an overall VTE rate of 2.99% (DVT 2.67% and PE 0.32%) and concluded that clinically detectable thromboembolic events after surgical treatment of ankle fractures are uncommon and do not appear to be influenced by the use of thromboprophylaxis.

In the paper from Cambridge⁸, the estimated rates of DVT, PE and fatal PE in patients undergoing elective foot and ankle surgery, were 0.6%, 0.1% and 0.02%. The NNT to prevent a single case of fatal PE was 10,000. They questioned the applicability of the NICE guidelines to patients having elective foot and ankle surgery.

The various controversies surrounding VTE in Foot and Ankle surgery were outlined. The incidence of DVT (in the general population vs foot and ankle patients; in elective vs trauma patients) and the clinical relevance (proximal vs distal; symptomatic vs asymptomatic) is all subject to controversy. The role of thromboprophylaxis, optimum duration of treatment, risks and benefits and costing issues were discussed.

Patients with tendoachilles rupture, treated surgically or non surgically, form a separate subgroup with higher incidence of DVT. Rates of DVT of upto 36% have been reported⁹ and follow up studies have revealed that 11% of these patients have features in keeping with post thrombotic syndrome¹⁰. Non weight bearing and immobilization are the risk factors for thromboembolism following foot and ankle surgery¹¹ and therefore functional rehabilitation and early progressive weight bearing is recommended after Achilles tendon ruptures. High BMI, increased age, air travel and use of oral contraception have also been implicated as risk factors for thromboembolism,

In summary, there is no convincing evidence of the role of low molecular heparins (LMWH) in the prophylaxis of venous thromboembolism following foot and ankle surgery. Symptomatic VTE in elective F&A surgery and low energy foot trauma is very low with higher incidence reported in ankle trauma, particularly TA injuries/surgery. Previous history of VTE, immobilisation, age, BMI, contraceptive pill are recognized risk factors with a cumulative effect.

Majority of the studies show distal asymptomatic DVT with paucity of data regarding long term sequelae. Major bleeding episodes following use of LMWH after foot and ankle surgery have not been reported. However heparin induced thrombocytopenia (HIT) after LMWH has been reported in 0.5% (1 in 200) and among these patients, there is a 10% risk of death. Thus a major concern is that current available data shows an estimated five time mortality increase from HIT compared to fatal PE with the use of VTE prophylaxis. This should therefore be taken into consideration prior to any

treatment with LMWH.

LMWH treatment is expensive and a 3 month course costs around £360, without taking into account the cost of training, administration, weekly platelet counts etc. The compliance with self administration is only 55-72%.

At present, the uptake among foot and ankle surgeons has been very variable with very few implementing NICE guidelines. The current BOFAS recommendation is for discussion with individual patients at pre-assessment with written information being provided. Patients should be individually assessed for the risk of developing VTE using the list of patient risk factors. The use of mechanical thromboprophylaxis including graduated compression stockings and intermittent calf/foot compression and the use of regional anaesthesia should be encouraged. Early mobilization would also help to reduce the risk of VTE.

Consensus voting:

Consensus on using mechanical prophylaxis for foot and ankle surgery 100%

Consensus on assessing risk for elective foot and ankle surgery 100%

Use of chemical thromboembolic prophylaxis in any foot and ankle elective surgical procedure

- 50% yes
- 50% no

Fred Robinson's views:

Most important factor from thromboembolic disease is death from a pulmonary embolus.

Patient and surgical factors to consider

NICE guidelines "Venous thromboembolism 2010" state:

- o Heparin induced thrombocytopenia risk rate is 1 in 200
 - Lee and warkentin 2004 heparin induced thrombocytopenia, New York; Marcel Dekker
- o Of these there is a 10% risk of death. This outcome from HIT is from a single paper (Lubenow et al 2006 Thromb Res 117;507-15).

NICE guidelines document (section 2.2.6) lower limb casts:

- Consider offering pharmacological VTE prophylaxis for patients with lower limb casts after evaluating the risks and benefits based on clinical discussion with the patient. Offer LMWH until cast removal.

Definition of DVT:

This was variable and was described as both:

proximal or distal to knee

symptomatic or asymptomatic

References:

1. Kierkegaard A. Incidence of acute deep vein thrombosis in two districts. A phlebographic study. *Acta Chir Scand.* 1980;146(4):267-9.
2. Patil S, Gandhi J, Curzon I, Hui AC. Incidence of deep-vein thrombosis in patients with fractures of the ankle treated in a plaster cast *J Bone Joint Surg Br.* 2007 Oct;89(10):1340-3.
3. Kock HJ, Schmit-Neuerburg KP, Hanke J, Hakmann A, Althoff M, Rudofsky G, Hirche H. Ambulatory prevention of thrombosis with low molecular weight heparin in plaster immobilization of the lower extremity. *Chirurg.* 1993 Jun;64(6):483-91.
4. Jameson SS, Augustine A, James P, Serrano-Pedraza I, Oliver K, Townshend D, Reed MR. Venous thromboembolic events following foot and ankle surgery in the English National Health Service. *J Bone Joint Surg Br.* 2011 Apr;93(4):490-7.
5. Lapidus LJ, Ponzer S, Elvin A, Levander C, Lärfsars G, Rosfors S, de Bri E. Prolonged thromboprophylaxis with Dalteparin during immobilization after ankle fracture surgery: a randomized placebo-controlled, double-blind study *Acta Orthop.* 2007 Aug;78(4):528-35.
6. Soohoo NF, Farng E, Zingmond DS. Incidence of pulmonary embolism following surgical treatment of metatarsal fractures. *Foot Ankle Int.* 2010 Jul;31(7):600-3.
7. Pelet S et al: The incidence of thromboembolic events in surgically treated ankle fracture; *J Bone Joint Surg Am.* 2012; 94, 502-6.
8. Hamilton PD, Hariharan K, Robinson AN. Thromboprophylaxis in elective foot and ankle patients – current practice in the United Kingdom; *Foot Ankle Surg.* 2011 Jun;17(2):89-93.
9. Lapidus LJ, Rosfors S, Ponzer S, Levander C, Elvin A, Lärfsars G, de Bri E. Prolonged thromboprophylaxis with dalteparin after surgical treatment of achilles tendon rupture: a randomized, placebo-controlled study. *J Orthop Trauma.* 2007 Jan;21(1):52-7.
10. Persson LM, Lapidus LJ, Lärfsars G, Rosfors S. Deep venous thrombosis after surgery for Achilles

tendon rupture: a provoked transient event with minor long-term sequelae. *J Thromb Haemost.* 2011 Aug;9(8):1493-9.

11. Mizel MS, Temple HT, Michelson JD, et al Thromboembolism after foot and ankle surgery. A multicenter study. *Clin Orthop Relat Res.* 1998 Mar;(348):180-5.

Consensus session 4

Total Ankle Replacement

Total ankle replacements have been used increasingly in the last ten years for ankle arthritis. There are currently 16 different implants on the market. The indications for an ankle replacement include painful osteoarthritis, post traumatic osteoarthritis, rheumatoid arthritis and revision of a failed implant. The contraindications to surgery are a charcot joint, neurological imbalance and infection.

Moderate and severe coronal deformity to the ankle is a relative contraindication. The greater the ankle deformity the greater the risk of total ankle replacement failure. For a successful ankle replacement the cause of the deformity needs to be addressed. Recently published studies have shown comparable results for ankles with a coronal deformity over 10 deg but less than 25 deg (Dhar, Reddy).

TAR – Stress Shielding & Bone Lysis:

Recently the Ankle Evolution System (AES) total ankle replacement implants manufactured in France by Transysteme has been withdrawn from the market due to concerns of osteolysis around the implant leading to a high rate of failure (Besse 2009, Koivu 2009, Morgan 2010, Rodriguez 2010). A Medical Device Alert for the AES total ankle replacement has recommended Identifying patients and follow up at least annually including X-ray as appropriate. It is estimated 450 devices were implanted in the UK from 2002 to 2009.

Asymptomatic cysts have been reported in other designs. In 2009 Dhar reported 4 cases in a series of 123 Scandinavian Total Ankle Replacements (STAR) and in 2011 Rippstein reported 20 cases in a series of 228 Mobility ankle replacements (Dhar JBJS 2009, Rippstein JBJSa 2011).

It is unknown whether the cysts are a biological or mechanical response? Research is needed to determine the cause of the cysts and the significance of them.

- Implant PE, UHWPE, HXPE, hydroxyapatite coating
- Surgeon positing
- Patient genetic susceptibility

Outcomes in Ankle Replacement Surgery:

There are currently 16 different total ankle replacements currently on market. The UK, Sweden, Norway and New Zealand all have national joint registries. There have been three systematic reviews published on total ankle replacements (2005 Stengel, 2007 Haddad, 2010 Gougoulas).

Further review performed on primary total ankle replacements with more than 20 ankles in series and a minimum 2 year follow up. Old implants were excluded from the review.

51 papers and 6179 TAR

- 14% total complication rate
- VAS continued to improve for 5 years. Data only to 5 years
- AOFAS pre op 39
- AOFAS maintain improvement to 10 years. Data only to 10 years
- ROM pre op 22, post op 34
- Cumulative failure rate 1.9% per year, therefore 10 yr failure of 19%

Conclusions:

- Gait improves but not normal
- 9% rate intra operative complication
- 14% post operative complication
- 1.9% annual failure
- 25% TAR radiological abnormality

Consensus voting scenario 1:

65 year old male with post traumatic OA, hindfoot in neutral alignment, 20° arc of movement

TAR: 50%

Arthrodesis: 50%

Consensus voting scenario 2:

50 year old active male with similar findings as above

TAR: 5%

Arthrodesis: 95%

Convened participants of the 2012 Round Table Meeting were:

Andy Bing
Rick Brown
Callum Clark
Robert Clayton
Simon Clint
Tim Clough
Paul Cooke
Nick Cullen
Sunil Dhar
Nick Geary
Andrew Goldberg
Abhijit Guha
Matthew Henderson
Simon Henderson
Stephen Hepple
Mark Herron
Ioan Jones
Mike Karski
David Loveday
Rohit Madhav
Nilesh Makwana
Jit Mangwani
Stephen Parsons
Hari Prem
James Ritchie
Fred Robinson
Ben Rudge
Malik Siddique
Dishan Singh
Sam Singh
Nicholas Talbot
Rhys Thomas
Tim Williams
David Williamson

OrthoSolutions

Group



Ortho Solutions UK Ltd - UK
West Station Business Park,
Spital Road, Essex. CM9 6FF

Tel: +44 (0)1621 843 599
Fax: +44 (0)1621 858 953
Email: sales@orthosol.com

Ortho Solutions Inc - USA
10901 W Toller Dr, Suite 205,
Littleton, CO 80127

Tel: +1 (303) 495-5407
Fax: +1 (303) 495-5408
Email: us.sales@orthosol.com

Ortho Solutions Pty
Au PO Box 1330,
Milton, QLD. 4064

Tel: +61 (0) 4088468
Email: salespty@orthosol.com

orthosol.com

© 2018 Ortho Solutions UK Ltd, the OS logo and the
OxBridge logo are trademarks of Ortho Solutions UK Ltd.