

British Orthopaedic Foot Surgery Society

Bristol, UK—November 12, 1993

Chairman: Mr I. G. Winson and Professor Y. Takakura

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A meeting of the British Orthopaedic Foot Surgery Society was held at Bristol on November 12, 1993, as part of a Combined Meeting with the Japanese Society for Surgery of the Foot, with Mr I. G. Winson and Professor Y. Takakura in the chair.

REVISION ARTHRODESIS OF THE FIRST METATARSOPHALANGEAL JOINT FOLLOWING PRIMARY ARTHRODESIS FOR HALLUX VALGUS

D. J. McBride and E. G. Anderson (Glasgow).

In a previously reported prospective series, 354 primary metatarsophalangeal joint fusions were carried out in 258 patients. Twenty (5.6%) of these operations failed to produce sound bony fusion, but only 15 (4.2%) had symptoms of pain, lateral metatarsalgia, difficulty with footwear and limited activity, at a follow-up period of two to eight years (average five years).

Examination revealed swelling, tenderness and mobility at the site of fusion, and radiographs confirmed nonunion at the arthrodesis. There were 12 women and 3 men, with an age range of 43 to 61 years (average 50 years). All cases were unilateral and four patients had a successful fusion on the opposite side. The pre-operative diagnosis had been hallux valgus in every patient.

Staphylococcus aureus wound infection had occurred in seven of the 15 feet (46.7%). Of the three primary fixation methods used (screw, wire and staple), staple fixation showed the worst rate of symptomatic nonunion (seven cases from 81, 8.6%).

Secondary procedures were carried out under general anaesthesia, using cancellous iliac bone grafts and crossed Kirschner wire fixation. This operation resulted in asymptomatic clinical and radiological union in all cases by three months, with resolution of associated symptoms and an improvement in the examination findings. The technique appeared to be useful as a salvage procedure in such patients.

LONG TERM CHANGES IN SESAMOID POSITION AFTER KELLER'S ARTHROPLASTY AND FIRST METATARSOPHALANGEAL ARTHRODESIS

J. P. Ivory, R. Makin, H. Parmar and P. J. Gregg (Leicester).

A prospective trial of surgical management in elderly patients with painful first metatarsophalangeal joints was undertaken and a comparison of the changes in sesamoid position on standing radiographs five years after surgery by two operations was made.

A full set of radiographs was available in 72 of an original 110 feet in the trial. The two groups, having Keller's arthroplasty and arthrodesis respectively, were similar in age, sex distribution, diagnosis (hallux valgus or rigidus) and follow-up.

The position of the lateral sesamoid was measured relative to the base and to the longitudinal axis of the first metatarsal and the measurements were shown to be reproducible.

The sesamoid was found to move medially by 2mm following Keller's arthroplasty ($p < 0.01$) but not so after arthrodesis. There was no significant movement of the sesamoid either proximally or distally after either operation.

It has been suggested that following Keller's procedure, the sesamoid moves proximally due to release of its distal restraint. Also, it has been proposed that after arthrodesis, the adductor hallucis pulls the sesamoid laterally, helping to narrow the foot by pulling the whole first ray towards the midline of the foot. These concepts were not supported by these findings.

JONES TRANSFER TO THE LESSER RAYS IN METATARSALGIA

T. Mulier and G. Dereymaeker (Leuven, Belgium).

Lateral metatarsalgia had various causes, such as excessive length of the central metatarsals and their digits and/or an excessively vertical alignment of the bones. No mention has been made in the literature to the use of the Jones procedure to the lesser rays for metatarsalgia in adults. Diminishing the vertical angle of the metatarsals with the ground was the object of transferring the extensor tendons to the metatarsal necks.

Thirty-three operations were performed on 29 patients with metatarsalgia. All had claw toes and depressed metatarsal heads, associated with cavus foot deformity in 18 feet, decompensation of the anterior transverse arch in 12 feet and with miscellaneous causes in the other three feet.

The operation involved transfer of the long extensor tendon around the metatarsal neck, combined with proximal interphalangeal joint fusion, shortening the middle three digits.

Overall, the results were excellent in 25 feet (76%), fair in five feet (15%) and poor in three feet (9%). The worst group selected proved to be that with severely spread foot (three of six feet good, 50%, and two poor, 33%). Cavus feet did well, with 16 excellent (89%) and two fair (11%).

There were complications in six cases (18%), including three cases of stress fracture (9%).

INTRA-ARTICULAR CALCANEAL FRACTURES IN CHILDREN

P. C. Thomas and H. B. Casserly (Liverpool).

Six children with seven intra-articular calcaneal fractures were reviewed. There were five boys and one girl, with an age range nine to 13 years. The right heel was injured in five patients, with one bilateral case; all injuries were closed and sustained in falls from heights, typically 3 to 5m, with the bilateral case tumbling 17m. Associated injury occurred in two patients.

Six fractures were treated by open reduction and internal fixation, using plates and screws in three cases and Kirschner wires in three cases. One fracture required bone grafting. All operated cases had preoperative CT scans and the procedures were performed 5 to 11 days after injury. There were no perioperative complications and in particular, no wound problems.

One fracture was managed conservatively by inpatient elevation and ice-packs, followed by a non-weight bearing cast for six weeks.

Range of movement, heel width, pain, walking distance and ability to cross uneven ground were assessed at a mean of 25 months (range 4 to 60 months).

Of the six operated feet, four (67%) were considered to have excellent results and two poor. The poor results were in the bilateral case. The foot treated conservatively needed subtalar fusion for pain relief.

On review of the English Language literature there appeared to be no paper reporting open reduction of calcaneal fractures in children. This small series demonstrated that excellent results without wound troubles could be achieved with open reduction in the child.

THE ANATOMY OF THE DELTOID LIGAMENT AND MRI CORRELATION IN RELATION TO TIBIALIS POSTERIOR INCOMPETENCY

M. H. Jahss (New York).

The anatomy of the deltoid ligament complex was studied in 12 cadaver specimens by dissections and stress radiographs, combined with sequential sectioning of the

deltoid components. The resulting data were correlated with prior studies of patients exhibiting chronic deltoid insufficiency after long-standing tibialis posterior tendon rupture, using stress radiographs and stress MRI from patients who had had: no surgery, repair of tibialis posterior or triple arthrodesis.

The deltoid complex acts as a passive restraining force to midfoot abduction, flattening of the longitudinal arch, external rotation of the foot and lateral peritalar subluxation. This complex is intimately bound together, both anatomically and functionally. It includes not only the superficial and deep parts of the deltoid ligament, but the spring ligament, the sheaths of the medial ankle tendons and the capsules of the talonavicular joint, the sustentaculum and the medial talocalcaneal facet and the medial side of the posterior talocalcaneal joint. Disruption of the most powerful active medial stabiliser, the tibialis posterior, leads to gradual elongation and incompetency of the deltoid complex.

The findings indicated that chronic deltoid insufficiency resulted progressively in lateral peritalar subluxation, anteroposterior ankle instability, medial ankle instability, lateral ankle ligamentous damage and ultimately ankle osteoarthritis. The picture was of progressive worsening of the deformity about each six months over a 3 to 5 year period. Anatomically the deltoid complex functioned as a unit, rather than having individual portions assigned separate functional constraints.

RESULTS OF TOTAL ANKLE REPLACEMENT

Y. Takakura, Y. Tanaka, T. Kumai, T. Takaoka, K. Akiyama and S. Tamai (Nara, Japan).

A total of 89 ankles of 82 patients had total ankle arthroplasty from 1975 to 1992. There were 63 women (67 ankles) and 20 men (22). Of these, 45 patients (48 joints) average age 65 years had osteoarthritis; 33 patients (35) aged 58 years had rheumatoid arthritis and five (six joints) aged 44 years suffered haemophilic arthritis.

Before 1980, replacement was performed on 30 ankles of 28 people, using a metal and polyethylene prosthesis with cement. After 10 to 17 years, seven of these had been reoperated on (two revisions and five arthrodeses). Loosening and sinking of the device were seen in all patients by five years after operation.

Since 1980, 58 joints of 55 patients were replaced with a ceramic prosthesis, 12 with cement and later cases without, the tibial component was held with a screw and the talar by a keel, the alumina surfaces being coated with hydroxyapatite and bone marrow. At a follow-up of one to 11 years (mean 4.6 years) 69% of operations were successful. Four ankles had been reoperated, one revision and three fusions.

A clear zone on radiographs was seen around the components of uncoated prostheses, but this gap was not seen with the ceramic plus hydroxyapatite plus marrow combination.

If the primary fixation and alignment are correct, ceramic ankle replacement provides good and stable results.

PATHOGENESIS OF CONGENITAL IDIOPATHIC CLUB FOOT: NEUROPHYSIOLOGICAL ANALYSIS WITH SOMATOSENSORY EVOKED POTENTIALS

Y. Imamura, E. Machida, S. Suzuki and S. Sano (Tokyo, Japan).

A number of theories have been presented to explain the aetiology of idiopathic congenital club foot, but the cause of the deformity remains unknown. This study aimed to clarify the matter by studying somatosensory evoked potentials (SEP). The SEP response to tibial nerve stimulation at the ankle was recorded in 15 normal children

and in 11 with unilateral club foot. SEP were recorded from surface electrodes placed over twelfth thoracic and seventh cervical spinous processes and from C1 and C2 over the scalp.

In the normal group, the response over T12 and C7 consisted of triphasic potentials (positive - negative - positive) and the response over the scalp, C1 and C2 consisted of negative potentials after poorly defined initial positive potentials.

Latency of the response recorded over T12 reflected peripheral nerve conduction, while that from T12 to C7 and above measured spinal cord and brain conduction times.

In the club foot group latencies of the SEP were compared on the affected and non-affected sides. The latency recorded at the T12, C7 and scalp electrodes was delayed on the affected side.

The club foot group was subdivided into four, based on the SEP response: (1) normal, (2) peripheral lesion, (3) spinal cord lesion, and (4) brain lesion. In most cases of congenital club foot abnormal SEP were recognised in the central nervous system, and the study suggested that this may be one factor in the pathogenesis of the disorder.

TWENTY-NINE CASES OF TALAR FRACTURES IN CHILDREN UNDER THE AGE OF TEN

S. Inokuchi, K. Ogawa, N. Usami, T. Hoshino, E. Hiraishi, T. Hashimoto and M. Miyanage (Keio, Japan).

Over a 14 year period, 29 cases of talar fractures in children under 10 years of age were found, with a high incidence of complications. The average age was 7 years, but the commonest was 8 years. There were 20 boys and nine girls, injured on swings or in road accidents.

Fractures involved the talar neck in 23 feet (79%); of Hawkins Type I in 17, Type II in five and Type III in one) and the talar body in four (14%). No fracture was compound. Twenty-two cases (76%) had no significant displacement (under 3mm) and were treated in a below-knee cast, non-weight bearing until Hawkins favourable sign appeared. Seven cases with displacement (24%) were managed operatively, with internal fixation with Kirschner wires, and with a postoperative cast.

Avascular necrosis was noted in nine (41%) of the 22 cases treated conservatively and all those needing operation. Ten (59%) of the 17 Hawkins Type I neck fractures developed necrosis.

The authors observed that in half the cases, the fracture line appeared in the posterior wall of the sinus tarsi, rather than in the vault as in adults. With the interosseous ligament being inserted anteriorly on the talus, this would have cut off the blood supply from this source.

In cases of avascular necrosis the bone revascularised rapidly and the talar dome did not collapse. However, the affected talus and foot remained smaller than their opposite fellows.

Overall results were graded 21 excellent (72%), seven good (24%) and one fair (3%). Only one had pain at follow-up and no extra procedures were required after primary treatment.

THE LONG TERM RESULTS OF RESURFACING PROCEDURES OF THE SOLE

R. Bindra, K. Linge, R. W. H. Pho and L. Klernerman (Liverpool and Singapore).

The authors reviewed the long term results of 23 patients (11 men and 12 women, average age 41 years) who had undergone resurfacing for loss of tissue from the plantar surface. Aetiologies were trauma (13 cases) and surgical excision of soft tissue neoplasms (ten cases) and both clinical features and foot pressures were studied.

Thirteen patients were treated by split skin grafts and one more with a full thickness free graft. The remaining nine had more complex flap repairs.

Cases were classified as: Grade I - loss of skin, but not fat; Grade II - loss of skin and fat; Grade III - bony loss in addition. There were 14 patients in Grades I and II, of whom 11 had split skin grafts. Only two such split grafts suffered breakdown, but marginal hyperkeratosis was a problem.

On analysis of foot pressures, the operated foot exerted lower forces and had a statistically significant reduced area of contact compared with the opposite side. All procedures failed to restore normal weight bearing, but the loss of sensation did not seem to predispose to breakdown. Split skin grafts seemed to be the best choice of repair, at least initially.

ANKLE ARTHROSCOPY -- DIAGNOSTIC AND OPERATIVE ARTHROSCOPY IN POSTTRAUMATIC ANKLE PAIN

W. Van Nieuwenhuysse (Aalst, Netherlands).

Ankle arthroscopy provided a safe and effective method of diagnosis and treatment with few complications.

With the leg hanging over the end of the table,

without distraction, 20ml of saline was instilled. A 4mm arthroscope was inserted medially and other instruments laterally.

Retrospective study of 75 ankle arthroscopies showed medial cartilaginous impingement between the medial corner of the talus and the anterior lip of the tibia in half the cases - such lesions were shaved. Synovitis was present in over half the cases and in some nipping of posterior synovial folds was seen and resected. Major osteochondral lesions and loose bodies were treated as usual.

These lesions were caused mostly by simple ankle sprains or contusions, and technical investigations, such as plain radiograph, arthrography, CT scan, NMR and bone scan had given only vague indications of the underlying pathology. Arthroscopy provided not only a more accurate and direct diagnostic tool, but also the opportunity to treat the pathology.

Postoperatively, the procedure was more painful than after knee arthroscopy. Tibial lesions did better than talar ones, but overall results were good in 80% with no residual synovitis, no tenderness and full movement.

HIGH VELOCITY INJURIES TO THE TALUS

M. E. Lovell, R. Spencer-Jones, A. Bass, G. Varley and A. D. Green (Douglas, Isle of Man).

Presented were 15 cases of high velocity injury to the talus among 14 patients treated on the Isle of Man since 1988. Thirteen injuries (12 patients) were sustained during high speed motorcycle crashes. The distribution of injuries and their management was as set out in Table I below.

One patient sustained bilateral talar fracture with an extruded talar body on one side.

The mechanism seemed to be of hyperflexion of the foot as the foot hits the ground. At operation the dome of the talus often was found to be fissured, with cartilage loss.

As the injured were usually island visitors, follow-up was available on only seven cases (see Table II). At an average of 3 years, five are asymptomatic with a good range of movement, one has restriction of motion with some pain and one has required a secondary subtalar fusion after avascular necrosis.

None of these fractures were isolated injuries. One patient died of his head injury. The finding of a talar fracture in a motor-cyclist was an indication that severe injuries elsewhere were likely.

Table I. The talar injuries and their treatment

Type	No.	Treatment
Neck:		
Hawkins I	5	Conservative
Hawkins II	1	Closed manipulation
	2 =	
	1	
Hawkins III	5 = 7	Open reduction and fixation
Dome + body	1	
Neck + extrusion body	2 (compound)	Debridement and late Blair fracture

Table II. Outcome where the talus was retained

Type	No and treatment	Outcome
Neck:		
Hawkins I injury	1	Death assoc
	5 = 1	Lost to follow-up
	3	Good
Hawkins II	1	Poor
	2 = 1	Good
Hawkins III	5 (Open red + screw)	All lost to follow-up
Dome	1 (Open red + screw)	Good

CHANGES IN TIBIOTALAR CONTACT WITH CALCANEAL OSTEOTOMY

A. C. Fairbank, P. Fortin, R. H. Jinnah and M. Myerson (Baltimore, USA).

The effect of calcaneal osteotomy on tibiotalar joint contact patterns in both normal and flat foot models was investigated. Six fresh cadaveric ankles were axially loaded with 700N and the tibiotalar joint characteristics were quantified using Fuji Superlow pressure film. The foot was unconstrained and was loaded in neutral posture,

in 10° dorsiflexion and in 10° plantarflexion for each test sequence. Tibiotalar loading was performed both in a materials tester (Method 1) and manually using a customised jig (Method 2). An osteotomy of the calcaneus was then performed and the calcaneus was translated medially or laterally by 10mm, after which the whole testing sequence was repeated. A flatfoot model was simulated by soft tissue section and all the above testing sequences performed again.

Images were analysed using a Bioquant Video system for Method 1 and an Orthographics Digitising Tablet for Method 2.

For Method 1 there was no difference in the quantitative tibiotalar joint contact characteristics, with the exception of all parameters evaluated with the foot in plantar-flexion ($p=0.062$). For Method 2 in the normal foot, a lateral translational osteotomy had no effect, but a medial osteotomy was associated with a change in tibiotalar contact ($p=0.05$). The flatfoot model (with Method 2) showed a qualitative shift of pressure laterally and a quantitative alteration of the contact area in all positions, when compared with the normal foot ($p=0.06$). A medial translational osteotomy significantly altered this contact area ($p=0.001$) and shifted it laterally.

As hindfoot alignment could affect tibio-talar joint characteristics, a calcaneal osteotomy might be a useful alternative to arthrodesis in cases of early tibiotalar arthritis secondary to severe varus or valgus hindfoot deformity.

A CONTROLLED PROSPECTIVE TRIAL OF A BIOMECHANICAL FOOT ORTHOSIS IN THE TREATMENT OF JUVENILE HALLUX VALGUS

T. E. Kilmartin, R. L. Barrington and W. A. Wallace (Nottingham).

A survey of 6000 nine to ten year old children found 122 (see Table III) with either unilateral or bilateral hallux valgus exceeding 15°. 106 (87%) of the children were girls. Any child with systemic disease was excluded.

After standing radiographs had been taken, the children were allocated randomly to one of a non-treatment control group and a treatment group, where custom made biomechanical foot orthoses were worn for three years. The orthosis was designed to control overpronation of the foot, on the premise that this posture would permit hypermobility of the first ray in an "unlocked" foot. No splintage was applied to the great toe itself.

Twenty-nine children were lost to follow-up, leaving 93 for study with a second standing radiograph taken at the end of the three year trial, which showed a deterioration of the metatarsophalangeal joint angle in both the treatment and the control groups. The deterioration in hallux valgus was generally worse in the treatment group (Table IV).

It was concluded that this type of prosthesis was not useful in the treatment of juvenile hallux valgus.

Table III. Children with hallux valgus

	No.	Lost boys	to F.U.	Remaining in full study
Control group	60	(9)	17	(1) 43 (8)
Treated group	62	(7)	12	(1) 50 (6)
	122	29	93	

Table IV. Deterioration in juvenile hallux valgus

	Worse by ...	
Control group	1.0 - 2.6°	$p < 0.05$
Treated group	1.3 - 3.4°	$P < 0.001$

ULTRASONOGRAPHY OF INFANTS' FEET -- A NEW IMAGING APPROACH

J. L. Barris, B. Wilson and D. Temperley (Manchester).

Ultrasonography is an established method for imaging the developing hip and various extra-skeletal sites, but it has not previously been described applied to the developing foot. Conventional plain radiographs of the infant's foot are difficult to interpret; in particular the navicular, unossified until the age of three years is not seen and the important talonavicular joint is difficult to assess.

Ultrasonography was carried out of 37 feet of 27 children aged between seven and 42 weeks. Diagnoses included: Normals (14 feet from 12 children); congenital talipes equinovarus (CTEV) (9 feet from 6); pes calcaneovalgus (9 from 7) and metatarsus adductus (5 from 4); and others. The children were examined by the Orthopaedic Surgeon and ultrasonography carried out by the Radiologists, using a 5 MHz high-density probe.

The following views were used in all children: The

medial axial, with the forefoot abducted, which showed the front third of the talus (whose ossific centre was not coaxial with its cartilaginous anlage), the navicular, the medial cuneiform and the first ray, and permitted measurement of the talonavicular (T.Nav^{*}) and naviculocuneiform (N.Cun^{*}) angles and displayed talonavicular joint congruency; the inferior coronal, allowing calculation of the coronal midfoot index (CMFI); the posterior sagittal, which demonstrated the tibial physis and epiphysis, the talus, the posterior subtalar joint, the calcaneum and the tendo Achillis, and allowed measurements of the heights of the bones for the tibio-calcaneal ratio (Tib.CR).

The usual errors were, intraobserver 9.2% and interobserver 6.3%.

The following measurements were made: The Tib.CR as the ratio of the distance of the distal tibial physis from the posterior corner of the calcaneum to the tibial epiphysal height; the CMFI as the ratio of the medial midfoot height to the width at the distal end of the cuboid and the angles between the long axes of talus, navicular and medial cuneiform (including also the talo-cuneiform angle, T.Cun^{*}).

The results are laid out in Table V, where the readings represent respectively the mean value, the standard deviation and the significance of the difference from normal (NS = not significant).

Table V. Summary of the figure obtained

	Normal CTEV		Calc. valgus	Meta.T.us adductus
Tib.CR	5.6 ± 0.7	4.3 ± 0.5	5.9 ± 0.7	5.5 ± 0.1
			NS	NS
CMFI	0.50 ± 0.1	0.53 ± 0.1	0.51 ± 0.1	0.51 ± 0.1
		NS	NS	NS
T.Cun [*]	185.6 ± 3.4	143.3 ± 14.6	198.5 ± 10.8	162.3 ± 6.4
		p < 0.001	p < 0.005	NS
T.Nav [*]	90.5 ± 7.4	64.3 ± 13.2	89.9 ± 5.6	88.6 ± 5.3
		p < 0.001	NS	NS
N.Cun [*]	94.9 ± 7.2	79.4 ± 8.5	108.3 ± 6.5	73.8 ± 6.9
		p < 0.001	p < 0.001	p < 0.01

HALLUX RIGIDUS -- A CASE AGAINST JOINT DESTRUCTION

V. V. Desai, G. Ziropoulos, J. J. Dias and A. P. J. Henry (Derby).

A retrospective survey was carried out of 38 big toes of 29 patients with hallux rigidus, after each had had extension osteotomy of the base of the proximal phalanx, combined with excision of osteophytes from the first metatarsal head. Twenty-six patients were women (90%), the mean age was 50 years (range 32 to 76 years) and the average follow-up was nearly 5 years.

Pain noted preoperatively was relieved in 29 toes (76%), improved in six toes and unchanged or worse in three. The feeling of stiffness perceived by the patients before operation was relieved in 19 toes (50%), improved in 14 (37%) and persisted in only five. Walking distance was better in all patients. Footprints showed full weight bearing on the hallux in all but two toes.

The osteotomy had united in all patients. Three patients developed superficial infection, but none had deep sepsis. Two had late recurrence of symptoms and one had to have reoperation.

This simple operation, which preserves the metatarsophalangeal joint, gave good pain relief and improved function. It seemed useful for the majority of great toes in hallux rigidus, where the prime problem was pain at the push-off stage of walking (rather than rest pain) and, unlike chielectomy, preserves the whole of the contact surface of the joint. Further, it carries the

advantage that subsequent salvage by arthrodesis or arthroplasty is available.

SILASTIC HEMI-REPLACEMENT FOR THE PAINFUL GREAT TOE

S. Ansari, R. Fitzgertland and H. B. Naik (Glasgow).

Presented was a retrospective study of 108 single stem silastic replacements for the treatment of the painful first metatarsophalangeal joints of 84 patients with osteoarthritis, due either to hallux rigidus or to secondary changes in severe hallux valgus.

Careful clinical and radiological analysis was conducted at an average of six years (four to nine years) after the operation, at which time the mean age of the patients was 56 years.

Patient satisfaction and acceptance of the procedure was good (92%). Eighty-seven per cent obtained complete pain relief and definite cosmetic improvement. The arc of motion at the joint averaged 48° with good great toe function and normal take off in the gait cycle.

Lucency around the implant and erosion at the base of the prosthesis was seen and proved progressive (with an incidence of 44% at a follow-up less than six years and of 69% after six years), but was asymptomatic.

Five prostheses required removal within two years of implantation due to persistent pain, but reactive synovitis due to silastic wear particles was absent, even in the longest surviving cases. Hallux extensus was the complication most seen (15%) and was associated with prosthetic displacement.

Overall results were similar in both hallux rigidus and valgus. Patients over 60 years of age had superior results both subjectively and objectively.

Single stem silastic replacement seems still to offer an effective functional and cosmetic treatment, while removing pain from the arthritic great toe. The procedure could be recommended for patients aged 60 years or older with osteoarthritis mainly involving the proximal phalanx, with or without deformity of the great toe. Conversion to a Keller's or a double stem arthroplasty remained possible if needed.

PERCUTANEOUS ACHILLES TENDON LENGTHENING -- A PROSPECTIVE TRIAL

D. N. Teanby and R. W. Paton (Blackburn).

A prospective trial of 26 percutaneous tendo Achillis lengthenings in 17 children was undertaken. The mean age was eight years. The aetiology in 12 of the cases was of cerebral palsy.

The technique used was that of Hoke and Hatt, in which three percutaneous hemisections were made, the first laterally about 2.5cm above the heel, a second medially and a third laterally, in each case cutting from the centre to the edge of the tendon. No tourniquet or sutures were required and each lengthening took less than one minute, excluding the application of the below knee cast, which was retained for six weeks. Adequate correction was obtained without need for any additional open procedures.

Preoperative equinus deformity averaged 10° and postoperative dorsiflexion 9°, the mean improvement being 19°. The average stay was two days. There were no wound or neurovascular complications; there was no case of inadequate or of over-correction; there was no case of transection of the tendo Achillis.

This had proved to be a rapid, minimally invasive method of tendo Achillis lengthening and was to be recommended as the method of choice in children.

A NEW DEVELOPMENT IN THE TECHNIQUE OF ARTHROSCOPIC ARTHRODESIS OF THE ANKLE

J. F. Redden (Doncaster).

Arthrodesis is a well established procedure in the management of osteoarthritis of the ankle. Open techniques are accompanied by a long postoperative recovery and most large series contain a number of unsatisfactory results. Arthroscopic tibiotalar arthrodesis has been described and good results reported. One of the

major difficulties has been in gaining access to the tight joint space.

In a study of eight patients a new technique was described, using the conventional arthroscopic methods, but with the addition of a trans-medial-malleolar portal. This is cut with a 10mm trephine, passed horizontally, cutting the adjacent tibial and talar surfaces. This portal provided access for instruments further to prepare the surfaces for arthrodesis and also some cancellous graft material. Fixation was crossed cannulated screws, passed down at 45° from the medial and anterolateral tibia into the talus.

All patients had short postoperative hospital stay, spent 6 to 12 weeks in a cast and went on to satisfactory fusion.

Arthroscopic arthrodesis of the ankle was technically demanding, but had advantages in suitable patients, avoiding those with over 15° of varus or valgus deformity.

SEPSIS IN THE NEUROPATHIC DIABETIC FOOT

J. Sinha, M. Edmonds, J. Salisbury and E. M. Thomas (London).

Infection in neuropathic feet has been viewed with pessimism and small vessel disease has been blamed. The authors believed that sepsis in neuropathic diabetic feet having present peripheral pulses was associated with septic vasculitis and not microangiopathy. Where there was good vascularity, infection could be controlled by elevation, antibiotics, selective surgery (limited debridement or digital amputation) and the wound allowed to heal by secondary intention.

There were 27 diabetic patients (15 men and 12 women) presenting with sepsis of the foot over a two year period. The mean age was 54 years (range 26 to 80 years). Seven patients had sepsis in ischaemic feet and these required below knee amputations.

There were 20 patients who presented with diabetic neuropathy and discoloured toes (including six with gangrene), but all these feet had palpable pulses and Doppler studies showed a pressure index of 0.9 or greater. In nine patients a discoloured toe was associated with a web space infection, in two with plantar space sepsis and in nine with apical ulcers.

Bacteria, in multiple isolates, were grown from every toe, including staphylococci (14), β-haemolytic streptococci (5), enterobacteria (3), anaerobes (3) proteus (2) and klebsiella.

All patients were treated with antibiotics and eight responded to this alone; five needed surgical drainage and seven required limited amputations. All wounds were left open to allow regular dressings and all healed by secondary intention.

Histology of the amputated specimens showed acute septic vasculitis of the digital arteries, with occlusion of the lumen and infiltration of the arterial wall by polymorphs, including phagocytic cells containing bacteria.

THE RHEUMATIC HINDFOOT -- AN AREA OF NEGLECT

R. M. Kerry and I. Stockley (Sheffield).

Much attention has been given to the problem of the forefoot in rheumatoid arthritis, but few studies have been directed at the incidence of hindfoot troubles.

One hundred consecutive patients with classical rheumatoid arthritis were studied. There were 80 women and 20 men, with a mean duration of disease of 11 years. Patients were graded according to functional capacity. Thirty-two patients had foot symptoms at the time of presentation of their disease and 79 of walking difficulty in 76 patients and was particularly troublesome in those who had had successful arthroplasty of hip or knee.

Hindfoot symptoms (in 61%) were as common as those of the forefoot (in 59%) and at least as severe. Lateral hindfoot pain was associated with valgus deformity of the hindfoot. While midfoot deformity was common (69%), symptoms were rare (10%).

As hindfoot deformity was known to be progressive and was a predictor of failure of forefoot surgery, it was stressed that early consideration needed to be given to its prevention.