Acta orthop. scand. *50*, 601–605

PROCEEDINGS OF THE FINNISH ORTHOPAEDIC ASSOCIATION

Helsinki, Finland, November 11, 1978

EDITOR: A. ALHO

35 YEARS' EXPERIENCE OF KÜNTSCHER NAILING IN FINLAND

R. V. Lindholm
University of Oulu, Oulu

The first report concerning Küntscher nailing in Finland was published by Wasastjerna in 1943. According to the published reports, reaming of the medullary canal makes closed Küntscher nailing especially appropriate in the treatment of closed transverse and oblique midshaft fractures of the femur in adults. In tibial fractures, the method is recommended as a very valuable alternative to conservative treatment of midshaft fractures, especially if early mobilization is advisable. In multiple injuries, the operative indications appear to be broader for the purpose of stabilization of the extremities. Küntscher nailing of the upper arm and the forearm has been performed too infrequently to permit analysis.

In the treatment of non-union of the femur, Küntscher nailing has also been recommended as a method of choice at sites not too close to metaphyses. It has also been recommended in the case of tibial and forearm non-union. Only limited experience has been gained of this method in the treatment of non-union of the humerus. Closed condylo-cephalic nailings of pertrochanteric fractures of the femur in the elderly have been performed with results comparable to those obtained with open methods of internal fixation. Küntscher nailing of metastatic fractures in long bones has been recommended as a useful palliative operation.

The general operative risk of Küntscher nailing seems low to moderate. Local complications have very seldom resulted in permanent disability.

VICTIMS OF FIGHTS AND ASSAULTS ATTENDING A CASUALTY DEPARTMENT

R. Honkanen, O. Kiviluoto & R. Nordström
Department of Orthopaedics and Traumatology, Helsinki University Central Hospital, Department of Public Health Science, University of Helsinki.

Victims of fights and assaults comprise about 8 per cent of all injured adult patients. The purpose of this study was to analyse their personal characteristics and injuries. From a yearly (1973) computer file of a large casualty department 518 victims of fights and assaults (=victims) and 496 persons accidentally injured (=controls) were randomly selected.

There was a greater proportion of males among the victims than among the controls (76 per cent vs. 61 per cent) and a greater number in the age group 15 to 44 years (81 per cent vs. 64 per cent). Fifty per cent of the victims and 8 per cent of the controls were intoxicated, while the rates of chronic misuse of alcohol were 37 per cent and 18 per cent, respectively. Forty-seven per cent of the victims and 18 per cent of the controls visited the emergency department at night.

Head injuries predominated in the victims (71 per cent vs. 22 per cent). A head wound was the most common diagnosis and a blow from a fist the most common mechanism of injury in the victim series, while ankle sprain and falls represented the most common injuries in the control series.

ELECTRICAL STIMULATION OF FRACTURE CALLUS CELLS *IN VITRO*

H. Aro, R. Penttinen & A. J. Aho
Departments of Biochemical Chemistry and Surgery, University of Turku, Turku.

Electrical stimuli, applied in various ways, are known to enhance osteogenesis *in vivo*. The mechanism behind this cellular response is still unknown.

In the present work callus cells, isolated from 9-day-old rat tibial fractures and cultured as oligolayers, were stimulated directly by biphasic asymmetric voltages (AC voltage pulses 150 mV, DC voltage 150 mV − 600 mV). The currents supplied had positive (+100 μA − +300 μA) and negative (−100 μA − −200 μA) peaks. Culture flasks were equipped with two Pt-Ir L-shaped electrodes and were stimulated for up to 96 hours.

The mitotic rate was monitored by counting the cells and the DNA synthesis by determining the uptake of ^{3}H-thymidine. In the early phase of

0001–6470/79/050601–05$02.50/0

© 1979 Munksgaard, Copenhagen

proliferation the incorporation of thymidine increased significantly by 45 per cent per cell using low voltage stimulation (DC 150 mV). Total protein and collagen synthesis was studied by labelling confluent cultures with ^{3}H-G-proline and determining radioactive hydroxyproline. The cultures responded to low voltage stimulation (DC 150 mV) by an increase in collagen synthesis, especially in the cathodal half of cell layer (30 per cent). Increase in the DC voltage up to 600 mV inhibited both DNA and protein syntheses. The stimulation – inhibition effect seems to be more dependent on voltage than on current.

THE ROLE OF APOPHYSEAL JOINTS IN LOW BACK PAIN AND SCIATICA

M. Tiililä
District Hospital, Kemijärvi

The apophyseal joints play an important role in spinal stenosis. In a series of 50 consecutive operations of the lower back the cause of pain was protrusion of the intervertebral disc alone in 17 cases, protrusion and spinal stenosis in 10 cases, spinal stenosis alone in 9 cases, and instability and other causes in 14 cases. Derangements of the apophyseal joints were the main cause of pain in 12 cases in this series.

CLOWARD'S ANTERIOR FUSION IN THE TREATMENT OF TRAUMATIC INJURY AND DEGENERATION OF THE CERVICAL SPINE

T. Tunturi, O. Leikkonen, T. Paakkala, P. Lepistö & P. Rokkanen
Institute of Clinical Sciences, University of Tampere and Central Hospital, Tampere

The series consisted of 29 patients operated on in 1968–75, 25 of whom were followed up until 1978. In 12 cases the indication for operation was severe radicular symptoms which did not respond to conservative treatment and which were connected with considerable degeneration of the corresponding spinal segment only. Seventeen patients were operated on for instability of the cervical spine caused by traumatic injury. The injury had been dislocation and radicular or medullary symptoms which persisted in spite of conservative treatment with skull traction or a collar.

The late result was evaluated with a view to objective neurological improvement, subjective improvement, present symptoms and working capacity. All fusions were radiologically successful. The late result was fair or better in 7/11 in the degeneration group and in 12/14 in the traumatic injury group. An age of over 35 years and a preoperative motor defect were statistically significant factors for a poor prognosis in the traumatic injury group. Preoperative sick-leave and preoperative symptoms lasting over 6 months were prognostic factors for a poor result in the degeneration group.

PARAPLEGIA AND TETRAPLEGIA IN SPINAL INJURIES

P. Lepistö, M. Härkönen, T. Paakkala, H. Pätiälä & P. Rokkanen
Institute of Clinical Sciences, University of Tampere, and Central Hospital, Tampere

Paraplegia was present in 11 and tetraplegia in 19 trauma patients treated at Tampere Central Hospital in 1968–75. The mean age of the patients was 33 years. Twenty-one patients were injured in the months May–August. The mean hospital stay was 71 days. Reduction and osteosynthesis with Williams plates were carried out on four patients with paraplegia. The patients with tetraplegia were treated conservatively. Tracheostomy was performed on seven patients with tetraplegia. Tracheal stricture developed in two patients. Continuous catheterization was used initially; infection of the urinary tract developed in all cases. Deep venous thrombosis developed in eight cases and pulmonary embolism in three. Pressure ulcers developed in eight patients. Ten patients died in hospital and three died later.

After an average interval of 5 years from the time of injury, seven patients with paraplegia and three with tetraplegia were being nursed at home, while one and six, respectively, were in institutional care. Five paraplegic patients were mobile in a wheelchair, one was bedridden and two were able to walk. Six tetraplegic patients used a wheelchair and three were bedridden. All patients were disabled.

It is condluded that the care of patients with paraplegia and tetraplegia should be organized centrally on a national basis in order to raise the level of therapy.

BRUNSWIK ARTHROPLASTY OF THE HIP JOINT: OPERATIVE TECHNIQUE, EARLY COMPLICATIONS AND RESULTS

H. Pätiälä, K. Vaahto, K. Lehto & P. Rokkanen
Institute of Clinical Sciences, University of Tampere, and Central Hospital, Tampere

At Surgical Unit II, Tampere Central Hospital, during an 18-month period, 76 patients were fitted

with 82 total hip prostheses using a postero-lateral incision. The mean duration of surgery was 67 minutes for teams with two to three surgeons and 80 minutes for teams with one surgeon. No statistically significant differences between the teams were observed at follow-up with regard to the occurrence of complications, the frequency of pain, the mobility of the hip or the ability to walk.

PROXIMAL TIBIAL OSTEOTOMY: AN ANALYSIS OF 172 KNEES

O. Kiviluoto, P. Salenius & L.-E. Laurent
Orthopaedic Hospital of the Invalid Foundation, Helsinki

During the period 1966 to 1973, a proximal tibial osteotomy was performed on 183 patients with pain in the knee joint. In 1976 a questionnaire was sent to the patients. Answers were obtained from 162 patients, 10 of whom were operated on bilaterally (172 knees). The indication for operation was: osteoarthritis-135, sequelae after intra-articular fractures-15, rheumatoid arthritis-9, and faulty position of the knee joint-13. There were 117 varus knees and 45 valgus knees. Curved osteotomy was performed in 113 cases and wedge osteotomy in 24 cases.

Painless knees were found in 33 per cent of patients 3–10 years after surgery. The condition of 80 per cent of patients was improved after osteotomy, 9 per cent were worse than before the operation and in 11 per cent the pain remained unchanged. The range of flexion increased after surgery ($P < 0.05$). The results were better in females than in males ($P < 0.01$) and the results were better with curved osteotomy than with wedge osteotomy ($P < 0.05$). When the patients were treated postoperatively with a plaster from the groin to the malleolar region the results were more favourable than those obtained with a full-length plaster ($P < 0.01$). Immobilization for more than 10 weeks produced poorer results than immobilization of shorter duration ($P < 0.01$).

DIAGNOSIS OF ACUTE KNEE LIGAMENT INJURIES

A. Alho & A. Mølster
Section of Orthopaedics and Traumatology, University of Bergen, Norway

Fifty-one patients were admitted for acute knee injuries. After the primary evaluation, the knee was immoblized in a plaster splint overnight. In 37 cases after a repeated clinical examination it was considered that adequate information had been obtained. Eleven patients were treated conservatively and the follow-up proved this choice to be correct. In 14 cases the result of the clinical examination remained uncertain due to pain and muscle spasms. In four of these an examination under anaesthesia revealed that an operation was indicated.

Among the 30 operated patients, an abduction injury was diagnosed in 24 cases. In 15 cases with combined medial and anterior cruciate injuries a clear anteromedial instability was present. In two cases a rupture of the posterior cruciate ligament was also present with a valgus instability in extension in both cases and a positive anterior drawer sign in internal rotation in one case. An adduction injury was diagnosed in five cases and a sagittal injury in two cases. It is concluded that the aim of the preoperative examination of instability is not to get an anatomical diagnosis but an indication for operation. In doubtful cases, an examination under anaesthesia and arthroscopy may provide valuable additional information.

THE EFFECT OF IBUPROFEN AND INDOMETHACIN ON RECENT ANKLE AND FOOT SPRAINS

J.-E. Michelsson, M. Pasila & A. Sundholm
Department of Orthopaedics and Traumatology, Helsinki University Central Hospital

Sixty consecutive patients with recent ankle and foot sprains were treated with a Tensoplast® elastic bandage extending from the metatarsal heads to above the ankle. The patients were randomized into three groups, each consisting of 20 patients. After the application of the bandage the patients in the first group were given 1200 mg of ibuprofen, in the second group indomethacin, and in the third group a corresponding amount of placebo capsules daily for 5 days. The recovery of the sprains was compared using 10 parameters: active dorsal and plantar flexion, inversion and eversion of the foot, tolerance of body weight support on the toes and heel, swelling, pain at rest, local tenderness and limping. The examinations and registrations were performed at the beginning of the treatment and 1 week later. The patients were followed up until they returned to work. It was possible to complete examinations on 56 of the 60 patients. Wilcoxon's test was used for the statistical analyses.

The mean sick leave period was 9–10 days in each group. There were no statistically significant differences between the three treatment groups as regards the parameters applied. In this study, the patients with recent ankle and foot sprains gained no benefit from the anti-inflammatory drugs ibuprofen and indomethacin.

ARTHRODESIS OF THE WRIST IN RHEUMATOID ARTHRITIS

V. Vahvanen & P. Kettunen
Aurora Hospital, Helsinki

Sixty-two arthrodeses were performed on 58 patients. The arthrodesis technique was bone grafting using the distal end of the ulna in 54 patients, and a modified version of the technique of Mannerfelt & Malmsten (1971) in 8 patients. All eight wrists immobilized with a Rush pin healed well. There were two cases of pseudarthrosis (3.2 per cent); rearthrodesis by bone grafting was successful in both cases. One patient had a snapping phenomenon in the ulna and four patients had some other complaints.

The joint between the trapezium and the scaphoid was open in 48 per cent and the joints around the os triquetrum were open in about 47 per cent. In 37 per cent the second carpometacarpal joint fused spontaneously and the third carpometacarpal joint nearly as often. The first and fifth carpometacarpal joints were always open and mobile, and the fourth carpometacarpal joint was fused in only three patients.

According to our functional analysis, the position of the hand should show only slight ulnar deviation with the angle between the radius and the second metacarpal bone being less than 10°. Either slight dorsal flexion or zero position is recommended.

ENTRAPMENT NEUROPATHY OF THE RADIAL NERVE IN THE FOREARM

M. Vastamäki & K. A. Solonen
Orthopaedic Hospital of the Invalid Foundation, Helsinki

The present series consists of 12 patients with entrapment of the radial nerve. Eight patients had "radial tunnel syndrome" with compression of the nerve at the level of the radiohumeral joint. They had paraesthesia and sensory disturbances and, in two cases, symptoms of tennis elbow. Four patients had compression of the deep motor branch as it passes beneath the fibrous arcade of Frohse into the supinator muscle. They had weakness in the corresponding motor functions.

The mean age of the patients was 33 years; five of them were female. Surgical decompression was performed in all cases. Only one patient with long-standing neuropathy did not recover during the follow-up time, which was on average 15 months.

TOE-TO-THUMB TRANSFER BY MICRO-NEUROVASCULAR ANASTOMOSIS

K. A. Solonen, H. Brummer & T. Telaranta
Department of Hand Surgery, Orthopaedic Hospital of the Invalid Foundation, Helsinki

O'Brien's method (1975, 1977) was adopted for free toe-to-thumb transfer by microneurovascular anastomoses in three cases.

The first patient was a girl of 12 who had lost all but $1\frac{1}{2}$ ulnar digits of her right hand 20 months earlier. The second toe was transplanted to the thumb metacarpal. The second patient was a male of 28. He had lost the right thumb through the MP joint 9 months earlier. In this case a hallux-to-thumb transfer was performed. The third patient, a female aged 31, had had traumatic amputation of her right hand transcarpally and loss of the first and second digits of the left hand transmetacarpally 12 months previously. A transfer of the left great toe to the left hand to replace the thumb was performed.

There were no postoperative complications in the hands, and the primary results are promising. The observation time, however, is too short to permit final assessments.

SOFT TISSUE SARCOMAS. A REPORT OF 153 CONSECUTIVE CASES

S. Santavirta, P. Gröhn, E. Heinonen, J. Sandelin & B. Sundell
Radiotherapy Department, Division of Orthopaedic Surgery and Traumatology and Division of Plastic Surgery, Surgical Hospital, University Central Hospital, Helsinki

A total of 153 patients with soft tissue sarcoma were treated during 1965–1975. The age of the patients varied between 12 and 80 years (mean 45 years). Fibrosarcoma and unclassified sarcoma represented more than 50 per cent of the total series. Most of the tumours (67 per cent) were located in the extremities.

The disease recurred in 100 cases (65 per cent) in the 3 year follow-up period. There were 48 local recurrences and 52 distant metastases. The primary site of distant metastases was the lungs (44/52). Rhabdomyosarcoma turned out to be the most aggressive (15/16 recurred). The patients with synovial sarcoma differed from the others; they developed only distant metastases in the lungs. The size of the tumour had no prognostic value.

No definite conclusions can be drawn as to the superiority of the treatment modality as the series was retrospective. Postoperative radiotherapy seemed to decrease the number of local recurrences (25/101) compared with excision of the tumour alone (17/34). Distant metastases were less frequent in the local excision group (5/34) than in the combined treatment group (36/101). Eleven of 12 patients who underwent amputation developed lung metastases. Radiotherapy was tried on five inoperable large tumours with a recurrence in every case.

On the basis of the present results and the recent suggestions from the American Joint Committee for Soft Tissue Sarcomas and the EORTC, it seems that adjuvant therapy should be adapted to the histopathological degree of malignancy.

ANGIOGRAPHY IN THE DIAGNOSTICS OF MALIGNANT SOFT TISSUE TUMOURS

S. Tötterman & S. Santavirta
Fourth Department of Surgery and Division of Orthopaedic Surgery and Traumatology, Surgical Hospital, University Central Hospital, Helsinki

Thirty-seven soft tissue arteriographic studies were performed on 35 patients; in 33 cases the lesion was localized in the extremities. Pharmacoangiography was performed in 20 cases, the vasoactive agent being angiotensine or tolazoline. Angiography proved successful in distinguishing between benign and malignant lesions, the character of the tumour being resolved in 30 out of 37 cases. The anatomic extent and the source of vascular supply was defined in 26 cases. In recurrent tumours, however, angiography proved less successful.