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Partridge osteosynthesis: an asset in the treatment of sub- and supraprosthetic femoral fractures?

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Partridge (England) first described this osteosynthesis in 1976. It involves the use of nylon plates and cerclage bands. The development of this osteosynthesis was prompted by problems in the treatment of sub- and supraprostetic femoral fractures in older patients with osteoporotic bones.

These fractures are localized at the level of the point of the medullary stem of the prosthesis; this impedes screw osteosynthesis but allows cerclage-like osteosynthesis according to the Partridge principle. The osteosynthesis material and the instruments designed for it permit a quick operation.

Little research has so far been done concerning the application and the mechanical properties of the Partridge osteosynthesis. Our study has focused on:
1) Vasularization problems attending the use of cerclage bands and wires, studied in rabbit and dog femurs;
2) Mechanical properties, tested in a torsion bench on human femurs submitted to various techniques of osteosynthesis;
3) Treatment of patients with the aid of a Partridge osteosynthesis.

Results. Vascularization proved not to be obstructed by Partridge bands, whereas flat bands caused obstruction and cerclage wires cut into the bone. Moreover, signs of osteolysis were most marked at the pressure points of flat bands and cerclage wires. Mechanicallly, there was strong fixation of the fracture with good resistance to forces in the X-Y direction and in the direction of torsion and non-rigid union of the osteoporotic bones.

The 12 patients treated showed good results except for pseudarthrosis without dislocation in one patient and a technical operative failure resulting in dislocation in another. A striking amount of periosteal callus developed, possibly due to a reaction to the nylon and as a result of micromovement.

The Leach graft

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The results obtained with the Leach graft in the treatment of 11 patients with chronic lateral instability of the ankle joint were studie in retrospect: five right and six left ankle joints in six women and five men ranging in age from 17 to 42 years. The Leach graft is a modification of the Chrisman-Snook procedure in which the tendon of the peroneus brevis muscle is placed exactly in the anatomical course of the two ligaments. We have used this technique since November 1981. The last graft included in the series was performed in October 1984. The follow-up period therefore ranges from 4.5 months to 40 months, with an average of 22 months.

Ten patients complained of instability before the operation, nine also mentioned pain and nine complained of recurrent swelling; all showed a positive anterior drawer sign, ranging from + to +++. Varus instability was observed clinically in nine.

At the follow-up, three patients still complained of more or less marked instability. Only one showed clinical instability. Four reported slight stiffness of the treated ankle-joint. Four showed clinical evi-

dence of slightly impaired plantar flexion, but there was some discrepancy between the subjective complaints and the objective findings.

One of the 11 patients was not satisfied with the result of the operation, one was moderately satisfied, four were satisfied and five were very satisfied. Good-to-excellent results thus were obtained in 9 cases of 11.

What happens with a pedicled fascia lata graft used as a substitute for the anterior cruciate ligament?

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Substitution of cruciate ligaments using autogenous tendon or fascia material is still an unsolved problem. Fascia lata, for instance, is used to replace or reinforce the cruciate ligament after fresh ruptures. We studied fascia lata grafts in dogs 0–36 months after the operation macroscopically, histologically and by means of mechanical tests in an Instron test machine. Three of the 48 grafts ruptured. These knees showed varying degrees of arthrosis. Microscopic examination within a few days of the operation revealed graft necrosis followed by cellular infiltration and subsequent ingrowth of young connective tissue. The unattached part of the graft in the joint was synovially lined through ingrowth from adjacent tissues and cellular ingrowth in the the fibrin clot formed around the graft after the operation.

The graft was gradually replaced by newly formed connective tissue which structurally closely resembled the normal anterior cruciate ligament. Mechanical testing comparing these macroscopically and microscopically good-looking structures with a normal cruciate ligament, however, revealed far less satisfactory results. These tests were performed on 14 knees 1 year after the operation. The graft was weaker than a normal anterior cruciate ligament by a 50 per cent factor, and the breaking point of the first bundles was about one-third of the normal values when longitudinal traction was applied. Normal anterior cruciate ligaments in dogs rupture at the tibial insertion; the grafts ruptured intraligamentally.

The IDNS-3-G ("Nederpelt") elbow prosthesis

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The IDNS-3-G ("Nederpelt") elbow prosthesis, developed in Doetinchem on the basis of experience gained with 37 implantations since 1966, involves the use of a new method of fixation (so-called semi-rigid supplementary fixation). This prosthesis has been routinely used in our department since 1980.

A follow-up study was made on 19 cases, the follow-up period ranging from 1 month to 5 years (from 2 to 5 years in eight cases). The cause of the disturbed elbow function was rheumatoid arthritis in 16 cases, post-traumatic osteoarthritis in 1 case and congenital ankylosis in 2 cases. Indications for the prosthesis were pain (84 per cent), instability (73 per cent) and restricted movement (79 per cent). Pain was totally alleviated in 18 cases and almost entirely in 1 case.

All elbows showed complete postoperative stability. Maximum flexion averaged 140° in the rheumatic/traumatological group; flexion-extension movement averaged 115°, pronation 50° and supination 54°. Radiological follow-up revealed stable fixation of the prosthesis in all cases.

These findings would seem to indicate that the problem of humerus fixation of constrained elbow prostheses was solved satisfactorily in these cases. The postoperative results in terms of stability and mobility argue in favour of the continued use of the IDNS-3G ("Nederpelt") prosthesis in general, and especially in cases involving severe destruction and loss of stability.

Early results with the Oxford knee arthroplasty

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The Oxford knee arthroplasty is effected with a tripartite uni or bicompartmental prosthesis which consists of a flat metal tibial plateau, a polyethylen "meniscus" available in various thicknesses, and a spherical femoral component. No patellar prosthesis is used.

In a clinical follow-up study, 75 arthroplasties (36 total and 39 hemi-arthroplasties) were evaluated. The mean follow-up period ranged from 5 months to

2 years; the patients' ages ranged from 36 to 90 years.

According to the knee function assessment chart of the British Orthopaedic Research Association, 56 knees were classified as good, 14 as fair and 5 as poor. Preoperative varus or valgus deformities were corrected in 86 per cent of cases. The small number of patellar problems was a striking finding: 75 per cent of patients could ascend stairs unaided and 83 per cent had no difficulty getting up from a low chair;82 per cent were satisfied.

Contraindications are insufficiency of the posterior cruciate ligament, a flexion contracture of >40° and previous proximal tibial osteotomy with an acquired deformity of >10°. Complications were ruptured patellar ligament in 2 cases, dislocated meniscus in 1 case, superficial wound infection in 3 cases, fractured eminence in 1 case, detached tibial component in 1 case and medial ligament rupture in 1 case.

The results of limited soft tissue corrections in the treatment of refractory clubfoot

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The results obtained by treating 22 cases of "refractory" club-foot by limited posteromedial soft tissue correction were assessed after an average follow-up period of 8 years. Although some 50 per cent of the feet had been submitted to several operations, the results were good as assessed by the criteria formulated by Main and Wynne-Davis: final results were satisfactory or better in 18 of the 22 feet (81 per cent).

Patients treated primarily only by lengthening of the Achilles tendon subsequently required a medial correction, but this did not lead to less satisfactory results. No correlation was found between the clinical result and radiographic parameters such as the talo-calcaneal index.

Hemi-arthroplasty of the shoulder

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Serious disability due to shoulder lesions is rare, although some causes may be noted: rheumatoid arthritis, post-traumatic arthrosis and avascular necrosis. Disabling pain as a rule does not occur until deformation of the joint is far advanced. In such cases there is an indication for a shoulder prosthesis. Marked improvement of function cannot be expected, and the indication is therefore largely limited to alleviation of pain.

In the past 8 years, 12 patients have been given a humeral head prosthesis (an iso-elastic polyacetal resin prosthesis in 11 and a metal one in 1). Indications were: rheumatoid arthritis (6 cases), severe dislocation fracture of the humeral head (5 cases) and aneurysmal bone cyst (1 case). No postoperative complications were observed (postoperative management in an abduction cast). At the follow-up after an average of 27.2 months the patients were divided into four groups (very good, good, fair, and poor), according to range of motion, pain, function and subjective assessment. The six patients with rheumatoid arthritis all scored good to very good, as did the patient with an aneurysmal bone cyst. Of the six post-traumatic patients, three scored good and three fair.

The influence of some factors on the early results of the Bristow-Latarjet procedure

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In four hospitals the Bristow-Latarjet procedure was performed 52 times in a total of 51 patients with habitual total or partial dislocation of the shoulder, with a mean follow-up of 22 months. Subjective and objective results were determined and tangential radiographs were used to assess the quality of the coracoid tip fixation. Unstable bone-block fixation showed significantly less favourable results.

In cases with unstable bone-block fixation, slow rehabilitation and arthrotomy, external shoulder rotation was possible to a higher extent. Stable bone-block fixation was achieved in 90 per cent if the screw was fixed in the posterior cortex of the scapular neck without fracturing the bone-block.

Since in the case of unstable bone-block fixation the screw tends to migrate, it should be removed in order to prevent possible damage to adjacent shoulder structures. In a number of patients pain can be expected to abate and shoulder function may improve.

Preliminary results obtained with the uncemented ANAFORM femoral endoprosthesis

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Between May 1972 and December 1983, 51 proplast-lined femoral prostheses were inserted without cement. In 18 female and 19 male patients 37 prostheses were inserted primarily (Group I). In 8 female and 6 male patients 14 prostheses were inserted in a revision operation (Group II). The patient age was 62 (49–77) years.

Results obtained in Group I after a mean follow-up of 13 months were good to very good in 91 per cent and poor in 9 per cent, according to the Harris hip score. Results obtained in Group II after a mean follow-up of 12 months were good to very good in 64 per cent, fair in 21 per cent and poor in 15 per cent.

Treatment of compound fractures of the lower leg

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Sixty-two operations for compound lower leg fractures were performed over the period 1974–1981. The procedure of choice was determined on the basis of the Gauchoux classification This means that plate osteosynthesis was used in operations within 6 h of the accident for grade I compound fractures and for grade II oblique transverse spiral fractures or butterfly fractures (39 patients). An external fixator was used for all grade III compound fractures, multiple-fragment fractures or tiered fractures, and for operations performed later than 6 h after the accident (23 patients).

After plate osteosynthesis, deep infection developed in 3 cases; after external fixation, this was observed in 5 cases (including 2 Steinmann pin fistulae). The infections were treated by debridement. After external fixation pseudarthrosis developed in 5 cases (all in the group of multiple-fragment or tiered fractures). In 4 cases there was a postoperative defect measuring 3–10 cm. Consolidation took 13 weeks in 50 per cent of the fractures treated by plate osteosynthesis, and 20 weeks after external fixation. Ultimate consolidation was achieved in all cases.

Complications are not uncommon after treatment of compound lower leg fractures. Our results (rate of complication 11 per cent) compare favourably with national figures, possibly because: 1) we use an effective classification; 2) we deal quickly with postoperative complications or problems.

Lesions of the low cervical vertebral column. Classification, therapy and results

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In seven hospital departments a retrospective study was performed in order to evaluate the efficacy of the Allen classification in assessing lesions of the cervical vertebral column. The study included 300 patients with an accident between 1970 and 1983.

The Allen classification is based on anteroposterior and lateral radiographs at the time of the accident. Six classes are distinguished and arranged in three groups on the basis of the severity of the ligamentous and osseous lesions.

A follow-up on the first 75 patients led to the following conclusions. Class I (groups 1 through 3), involving a compression/flexion lesion, is stable and responds well to any form of bracing. Class II (groups 4 and 5) is unstable, as is class III (group 6), with distraction/flexion lesions. Class II requires anterior spondylodesis. Class III requires posterior spondylodesis after reduction.

The relation between intra-articular pressure and hip joint position in transient synovitis and Perthes' disease (synovitis stage)

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An attractive hypothesis on the pathognesis of Perthes' disease postulates occlusion of the retinacular vessels as a result of an increase in intra-articular pressure caused by tamponade of a joint. Since few data are available on intra-articular pressure in the presence of free fluid (synovitis), the hydrostatic intra-articular pressure was measured before and after hip joint aspiration with the joint in various positions. The subjects thus examined were 8 children with transient synovitis and 4 with Perthes' disease. Registration was done by means of an intra-articular epidural catheter linked to a pressure transducer with plotter. The diagnosis was based on clinical, radiographic and scintigraphic findings.

With the hip joint in 30° flexion the intra-articular pressure was always slightly increased and ranged

from 5 to 35 mm Hg. Upon extension from this position the pressure increased in all cases and ranged from 20 to 110 mm Hg. Internal rotation of the extendend hip joint produced an exponential increase in intra-articular pressure which ranged from 285 to 770 mm Hg. After aspiration of free fluid the intra-articular pressure was reduced to 0–5 mm Hg. Extension and extension/internal rotation produced an increase in intra-articular pressure, but always below the level of systolic pressure (8–18 and 25–88 mm Hg respectively).

The results indicate that intra-articular pressure in the hip joint depends not only on the presence of free fluid but above all on the position of the hip joint. It seems plausible that a hip joint position in extension/internal rotation – as assumed for longer periods during sleep in a lateral position – in the presence of free fluid may jeopardize the perfusion of the femoral head.