

Contrary to what one might expect, however, dead bone is also able to take up bone minerals (Ray *et al.* 1955) and because of this and the increased uptake in traumatic porosis the fractures were studied within 24 hours of injury.

Method: The fractures were immobilized in long leg plasters with a half-inch (1.25 cm) wide strip removed anteriorly to give identical counting conditions. ^{87m}Sr 100 μCi was injected intravenously and counting begun after 45 minutes when bone uptake of Sr equalled bone release. Counts were taken on both legs at points 2 cm apart.

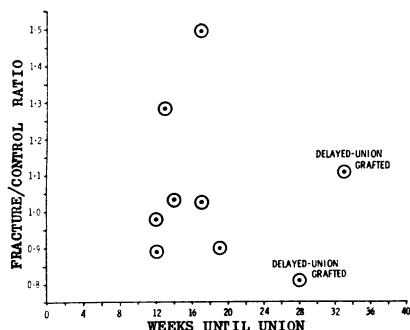


Fig 4 Fracture control ratios higher and lower than normal (i.e. 1.0) show both rapid and delayed union

Results

Nine normal patients were initially examined and it was revealed that the counting error between left and right sides was always less than 5%. Nine patients with unilateral fractures of the tibia were fully followed up and the fracture/control ratio compared to the time taken for union to occur (Fig 4). Results were: (1) With no significant difference between fracture and control sides time for union was 10–19 weeks. (2) Where the fracture site showed low uptake and delayed union might have been expected, one case united in 10 weeks. (3) Conversely, where the fractured side showed increased uptake one case also developed delayed union.

Conclusion

^{87m}Sr -uptake by fractures of the tibia within 24 hours of injury is of no prognostic value as regards the time taken for union to occur.

REFERENCES

- Arden G P (1960) *J. Bone Jt Surg.* 42B, 21
 Bauer G C H & Wendeborg B (1959) *J. Bone Jt Surg.* 41B, 558
 Boyd H B & Calandrucio R A (1963) *J. Bone Jt Surg.* 45A, 445
 Ray R D, Violette D la, Buckley H D & Mosiman R S (1955) *J. Bone Jt Surg.* 37A, 143
 Tucker F R (1950) *J. Bone Jt Surg.* 32B, 100

Spinal Fusion After Laminectomy for Cervical Myelopathy

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When conservative measures fail to control the progress of cervical myelopathy any neurosurgical intervention usually involves extensive laminectomy with the potential danger of provoking or increasing spinal instability. In this series we felt that spinal fusion after the neurosurgical procedure was desirable in 5 of the 50 patients subjected to operation.

Indications

- (1) When neck pain is a major complaint, especially in the presence of involuntary movement.
- (2) When unstable subluxation at one or more levels is present and likely to increase after laminectomy, or in fact develops later.
- (3) When root involvement causing pain in the arm could otherwise only be relieved by facetectomy with increased risk of instability.
- (4) When neurological deterioration after earlier operation is attributable to progressive disc degeneration or increasing deformity.

Because long anterior fusions, i.e. those spanning five or six joint levels, are fraught with difficulties and complications and, furthermore, require a separate approach, a posterior fusion has been performed using a long H-graft fixed by wires so firmly that external splintage is unnecessary. A tibial graft was used in one patient but the posterior ilium is better material osteogenetically and its natural curvature can give a closer fit to the cervical column.

Difficulties

- (1) The sitting position of the patient preferred by the neurosurgeon makes placing of the grafts awkward due to the effect of gravity, estimation and maintenance of the correct degree of extension much more difficult, and the posterior ilium inaccessible. The patient should therefore be placed prone after the neurosurgeon has finished, a manoeuvre requiring great care, many helpers and considerable re-towelling.
- (2) The safe passage of the wires under the laminae is tedious and may produce troublesome bleeding.
- (3) The massive posterior iliac graft is difficult to cut of sufficient length and breadth without cracking it.

Technique

The laminae and spinous processes of C2 and C7 or T1, as the case may be, and the intervening lateral masses are cleared and rawed. A passage

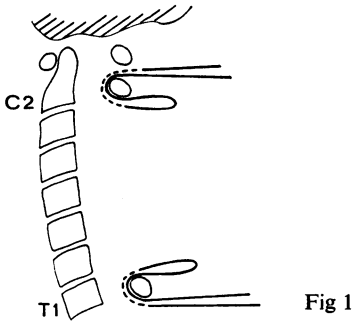


Fig 1

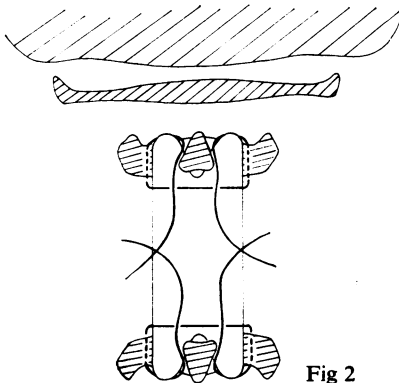


Fig 2

under the lamina on each side is cleared by patient work with a small curved dissector or aneurysm needle and the wires passed as illustrated (Figs 1 & 2). At the lower margin of the lamina of

T1 fine bone nibblers or a burr may be needed. Neck extension should be the maximum acceptable. The length of graft required is measured with calipers and the graft cut and shaped. It is laid in position with each end under the wire loop. It must lie well clear of the theca, which implies that the graft may have to be placed cortex forward if its curvature is too sharp or if the neck cannot be extended. The ends of the wires are pulled tight, passed in opposite directions around the spinous process at the opposite end, and made fast in any convenient way to maintain tension between the spinous processes (Figs 3 & 4). This fixes the H-graft firmly to the laminae and maintains the chosen degree of extension.

A further strip of iliac cortical bone down each side may be needed to prevent the cancellous chips that are now packed along the lateral masses from being displaced on to the theca.

No external splintage other than a felt or Plastazote collar for three months is used. The patient may be allowed up within a few days of operation.

Complications

The graft is a big one and lies superficially. It is difficult to suture the neck muscles satisfactorily over it; they atrophy and often stretch laterally to leave a broad, depressed, adherent and rather ugly scar. In spite of the use of Redivac drains on each side, there is usually some serosanguineous discharge from the wound

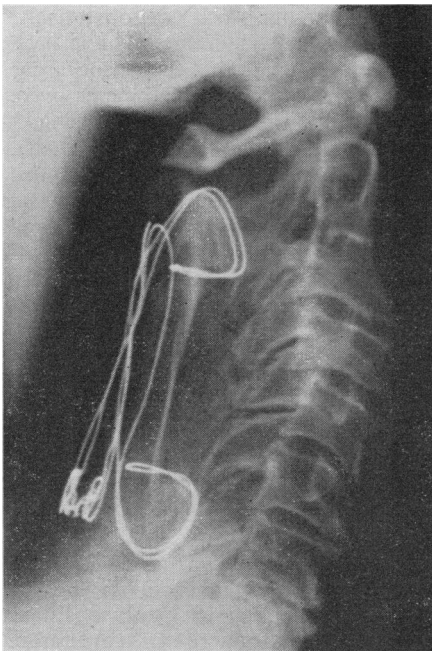


Fig 3

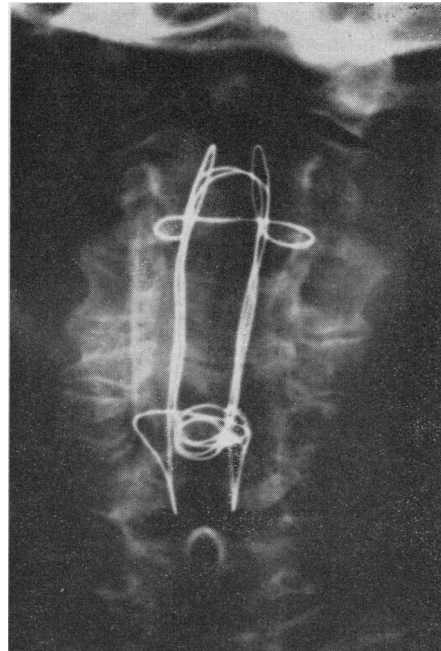


Fig 4

for a week or two, and when CSF is discharged too the post-operative period is naturally one of some anxiety. Furthermore suction drainage of CSF may in itself endanger the cord. In only one was the discharge other than sterile and this settled following treatment by antibiotics alone. In one patient the tip of the spinous process of T1 fractured later and needed removal for persistent local pain.

Results

In all 5 patients neck symptoms were cured or markedly relieved. Bony fusion appears solid in 3 and doubtful in 2 cases.

The following papers were also read:

Some Engineering Properties of Cortical Bone
Mr W D Biggs

Cervical Myelopathy
Mr J R W Gleave

Cartilage Enzymes in Rheumatoid Arthritis
Dr J T Dingle

Bone and Joint Problems in Renal Transplantation
Mr D Rosborough

Meeting November 3 1970

Papers

Infection in Total Prosthetic Replacement of the Hip and Knee Joints

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Total replacement of the hip- and knee-joints, whilst conferring great benefit on a rapidly increasing number of people, carries with it the serious complication of infection. Charnley (1969) has recently analysed and discussed the problem as it applies to a specialized unit. This paper presents a critical review of the first 5 years of total replacement arthroplasty of the hip and knee in a general orthopaedic and accident unit.

Clinical Material

Nearly all the operations were performed in two hospitals in the Windsor Group between 1965 and 1969 by five surgeons and their assistants. The remainder were private patients in nursing homes in the area. The operations formed part of a general orthopaedic list.

Four hundred and seventy-one total replacements were carried out in 374 patients. This number comprised 380 replacements of the hip and 91 of the knee, and included primary procedures, conversions and revisions. The McKee-Farrar prosthesis was used in 323 hips, the remainder being the low-friction prosthesis of Charnley. The Shiers knee hinge was used in all but 2 patients, in whom a McKee hinge was inserted. Acrylic cement was used in all cases.

Two hundred and fifty-two operations were performed for osteoarthritis, 201 for rheumatoid arthritis and 18 for ankylosing spondylitis and the complications of femoral neck fracture.

Prophylactic antibiotics were not employed routinely, but local polybactrin spray was used in just under one-third of the operations. The hip replacements were mostly conducted under hypotensive anaesthesia, and in over two-thirds a lateral goblet incision was employed, turning up the greater trochanter. These cases were treated by skin traction for one week post-operatively. In the remainder an anterolateral approach between the gluteus medius and the tensor fasciae latae was used. The knee replacements were performed under tourniquet control, using a parapatellar incision, with excision of the patella. Post-operatively, a plaster cylinder was applied and retained for 10 days. Latterly it was windowed after 48 hours to inspect the wound for haematoma formation. Redivac drainage was employed throughout. All patients were nursed in the general orthopaedic wards.

Methods

The case notes and nursing reports of all patients who had undergone total replacement of the hip or knee were studied with particular reference to post-operative infection. The shortest period of follow up was 10 months. It was found possible to divide the infected cases into three types:

Superficial infection was taken as a proven infection of the wound as shown by obvious signs of suppuration, a significant rise in temperature