The management of an old fused hip after the occurrence of paraplegia

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Two patients are reported who suffered traumatic paraplegia, and had a long-standing fused hip joint. Both required an excision (Girdlestone) arthroplasty to allow them to sit and one, who made a late but substantial neurological recovery, eventually underwent a total hip replacement. Both suffered thromboembolic and urinary complications. These may not have occurred if the procedures had been carried out earlier. Early mobilisation of the hip joint is recommended in these circumstances.

Key words: fused hip; Girdlestone arthroplasty; paraplegia.

Introduction

The occurrence of paraplegia or paraparesis in a person who has a fused hip joint already, poses a difficult management problem. At the very outset the patient cannot sit on a conventional wheelchair, because his hip is fused in a relatively extended position. It therefore needs to be rendered mobile for rehabilitation to proceed. If the patient has a complete neurological lesion, the decision is not difficult. A Girdlestone arthroplasty will suffice. If however, the neurological lesion is incomplete, an excision arthroplasty will allow the patient to sit, but it renders the joint less stable. If he recovers to the point of being able to walk, this is a clear disadvantage. Two patients are reported whose case histories illustrate both problems.

Case reports

Case 1

A 29 year old male was admitted to the Royal North Shore Hospital on 15 September 1987 after a motor vehicle accident. He had no sensation below the twelfth thoracic dermatome, except for slight sparing in the right second and third lumbar

dermatomes. He had no motor function and no reflexes in his lower limbs. CT scans revealed a burst fracture of the second lumbar vertebra with almost total obliteration of the spinal canal. The patient had diastasis of his right sacroiliac joint and a fracture of the right medial malleolus. His left hip had been fused in 1981 (age 23) for post-traumatic arthritis.

His spinal fracture was managed by vertebroplasty of the second lumbar vertebra and an L1 to L3 spinal fusion using bilateral Harrington distraction rods from T11 to L4. Over the following 3 months, the only gains in function were grade 1 (MRC) sartorius activity bilaterally. During this time, he was mobilised in a semi-reclining wheelchair and experienced severe somatic low back pain. On 23 December 1987 a left Girdlestone arthroplasty was performed, followed by removal of the Harrington rods on 12 February 1988. These procedures allowed him to sit normally and his back pain resolved. He returned to work in a wheelchair, farming Angora goats. His stay in hospital was complicated by pulmonary embolism, urinary tract infections and bladder calculi. By May 1989, 20 months after injury, hamstrings and quadriceps had recovered to grade 4 bilaterally and the muscles controlling his feet were generally grade 2.

On 25 August 1989 a left S-ROM total hip

arthroplasty was performed. The patient had an uneventful recovery, and is now walking with crutches.

Case 2

A 41 year old male was involved in a motor vehicle accident on 14 October 1988. He had multiple fractures, including fractures of the eighth, ninth, and tenth thoracic vertebrae with complete loss of motor and sensory function caudal to T10. He had sustained a fracture of the left hip in a motor vehicle accident in 1970 (age 23 years), and subsequently underwent left hip arthrodesis. He was receiving the invalid pension as a result of this injury at the time of his second accident.

His paraplegia was managed initially at another hospital and he was transferred to the Royal North Shore Hospital on 18 January 1989. On 25 January 1989 a left Girdlestone arthroplasty was performed. The patient's hospital stay was complicated by recurrent deep venous thrombosis and urinary tract infections. By 13 February 1989 he had 90 degrees of left hip flexion and was able to sit in a standard wheelchair. He had no recovery of neurological function.

Discussion

The first stage of mobilisation after the occurrence of paraplegia is sitting a patient in a wheelchair. This is impossible if the hip is fused in the 'ideal' position, namely neutral in the coronal plane, 5 to 15 degrees of external rotation, and about 30 degrees of flexion.¹ Resection of heterotopic ossification from around the hip in patients with spinal cord injuries, has been advocated to improve hip flexion and hence sitting position.²

If a paraplegic patient with a fused hip has no prospect of neurological recovery, then it is logical to restore hip joint mobility. Excision arthroplasty of the hip, originally described by Girdlestone³ for the treatment of tuberculosis and acute pyogenic arthritis, is a suitable procedure. In an arthrodesed hip, this implies taking apart the arthrodesis and excising the femoral head and neck. If

however, neurological recovery is possible, as suggested by motor or sensory sparing, no matter how minor, then many other factors must be considered. The rate and extent of neurological recovery are unpredictable. A patient requires a minimum of grade 4 muscle power about the hip to control it. In Case 1, the patient had a neurological injury superimposed on 6 years of hip muscle disuse. If early and substantial neurological recovery had occurred, total hip arthroplasty would have been considered. Conversion of the fused hip to a total hip replacement is known to give a good functional range of movement, with maintenance of stability.^{4,5} However total replacement is generally avoided in paralysed limbs, because of the lack of muscle control and the risk of dislocation. Knudsen *et al*⁶ reported one patient with a spinal cord lesion who underwent total hip replacement with an 'acceptable' result, but the precise extent of the deficit was not disclosed. In Case 1, significant recovery did not occur in the first 3 months after injury. Thus, it seemed appropriate to apply the simpler solution—Girdlestone arthroplasty.

The time from accident to hip mobilisation was 99 days in Case 1 and 103 days in Case 2. In retrospect, a Girdlestone arthroplasty should have been carried out much earlier in both patients to reduce the risk of thromboembolic and urinary tract complications, from which they had both suffered. Had the second patient been managed in our institution from the outset, it is likely that the procedure would have been carried out earlier. In both patients, excision arthroplasty was successful in allowing them to sit normally. The extent of late neurological recovery in the first patient was such that walking became a real possibility. Therefore restoration of hip stability, at the same time preserving motion, was required, and a total hip replacement was carried out. Conversion of a pseudarthrosis to a total hip replacement has been shown to be an effective procedure in terms of restoring hip stability, improving function, and decreasing leg length discrepancy.⁷ The risk of infection in total hip arthroplasty is increased when there has been previous surgery to the hip.⁸ There is also a risk of

heterotopic bone formation about the hip, both as a result of repeated surgery,^{9,10} and as a consequence of the neurological lesion.

It is the authors' impression that an early decision to restore hip mobility should be made, to minimise the risks of trophic ulceration, thromboembolism and urinary tract infection, and to allow rehabilitation to proceed. It is felt that advantages of this policy outweigh the possible complications

of a further procedure on the hip joint, in the event of neurological recovery.

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