BRIEF REPORTS

ANTERIOR TROCHANTERIC MUSCLE PEDICLE GRAFT

S. DAS DE, P. BALASUBRAMANIAM

We describe an anterior trochanteric muscle pedicle graft based on the gluteus medius and its neurovascular supply. Vascular injection and anatomical dissection were done in four cadavers to study the blood supply of this pedicle graft. The ascending branch of the superior gluteal artery was found to skirt the rim of the iliac crest to supply the gluteus medius and minimus muscles. The descending branch of the superior gluteal artery and the superior gluteal nerve enter the deep surface of the gluteus medius about 4 cm from the tip of the trochanter. Therefore the anterior third of the gluteus medius along with the anterior third of the greater trochanter can be safely mobilised as a pedicle up to this point without damaging the neurovascular supply.

This technique has been applied in five patients with encouraging results; three had nonunion of femoral neck fractures and two had avascular necrosis of the femoral head.

Technique. Patients with a fractured neck of femur were positioned supine on an orthopaedic traction table and internal fixation performed through a standard lateral approach. When closed reduction was difficult or unacceptable, open reduction was done through an anterolateral approach.

The anterior margin of gluteus medius is mobilised by finger dissection to its insertion into the greater trochanter. The anterior third of the greater trochanter is then osteotomised and the fibres of gluteus medius split for about 4 cm. The pedicle is shifted anterosuperiorly to the neck of the femur without tension, free bleeding should be seen from the cut surface of the trochanteric fragment at the end of the mobilisation. The trochanteric graft is then trimmed and placed in a slot 3 cm by 1 cm made on the anterosuperior aspect of the femoral neck (Fig. 1) and held in place by two cancellous screws.

Patients with avascular necrosis of the femoral head are operated on through an anterolateral approach, and a similar window is cut in the front of the femoral neck. Through this window new channels are created in the head of the femur with a curette, but kept to a minimum to avoid undue weakening of the bone. These channels are packed with corticocancellous strut grafts and the trochanteric pedicle graft is then placed in the slot and fixed with screws.

Discussion. A graft from the greater trochanter based on the attachment of the gluteus medius muscle was used by Hibbs in 1926 for arthrodesis of the hip. However, moving the whole of the greater trochanter with its

S. Das De, FRCS, FRCS Ed(Orth), MCh Orth, Senior Lecturer and Consultant
P. Balasubramaniam, FRCS, Professor
Department of Orthopaedic Surgery, National University Hospital,
Lower Kent Ridge Road, Singapore 0511, Republic of Singapore.

Correspondence to Dr S. Das De.

© 1991 British Editorial Society of Bone and Joint Surgery
0301-620X/91/1B92 $2.00
muscle attachments is difficult and is likely to affect the abductor mechanism. This will not matter if the hip is being fused, but does matter when the hip is mobile. With our technique, however, there was no detectable alteration in gait. The division in the anterior third of the gluteus medius should not extend for more than 4 cm from the tip of the trochanter to avoid damage to its nerve supply and a resultant limp. This limitation is confirmed by the studies of Brash (1955), Dall (1986), and Hardy and Synek (1988).

The vascularised bone graft can be mobilised easily during any anterior or lateral exposure of the hip and can be placed without tension in the anterior part of the femoral neck to bring in a new blood supply. The anterior approach to the femoral neck of the femur does not jeopardise any of the residual blood supply to the head which is usually from its posterior aspect.

The authors would like to thank Ms Joyce Tan for secretarial help.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

REFERENCES

BRACHIAL PLEXUS PALSY AFTER MANIPULATION OF THE SHOULDER

ROLFE BIRCH, JULIAN JESSOP, GARETH SCOTT

Manipulation for ‘frozen shoulder’ is a common practice. We describe three patients who developed severe brachial plexus palsy after manipulation of the shoulder under anaesthesia.

Case 1. A 49-year-old woman with a left ‘frozen shoulder’ had a manipulation under anaesthesia which gained 75° of abduction. One month later, after a second manipulation, the patient awoke from anaesthesia in severe pain and with a left brachial plexus palsy. Radiographs revealed anterior dislocation of the humeral head which was reduced under further anaesthesia. Two weeks later the infraclavicular plexus was explored; no rupture or significant contusion of any nerve trunk was seen. Conduction occurred along the posterior and the lateral cords but not along the medial cord. Causalgic pain was alleviated by sympathectomy and there was progressive recovery of the paralysed muscles over the following 20 months.

Case 2. A 33-year-old female kitchen assistant had manipulation under anaesthesia for severe right ‘frozen shoulder’. The same evening she had complete paralysis and loss of feeling of the arm but little pain. Electromyography later confirmed lesions of all the main nerve trunks. By six months recovery had started, first in the middle and lower trunks and later in the upper trunk. Despite assiduous physiotherapy the patient developed fixed contractures of the elbow and the fingers.

Case 3. A 49-year-old woman awoke after manipulation of her left shoulder under anaesthesia in intense pain and with extensive paralysis and loss of sensation in the upper limb. Physiotherapy, which was delayed for seven months, eventually relieved her pain and fixed deformities. The lower trunk of the brachial plexus failed to recover and tendon transfers were required to diminish the disability of the forearm and hand.

Discussion. Payan (1987) in his discussion of nerve lesions following faulty positioning of anaesthetised patients, referred to “anatomical variations of the thoracic outlet” as a predisposing factor in the causation of brachial plexus lesions. Of our patients, cases 2 and 3 had well-formed cervical ribs and case 1 had severe osteoarthritis of the cervical spine. There were other predisposing factors: case 1 was a non-insulin dependent diabetic and case 2 had a strong family history of rheumatoid arthritis.

Fracture of the humerus during shoulder manipulation is well known and the technique of Bayley and Kessel (1982) was proposed to minimise the risk. We thought that a further advantage of their technique was that it avoided undue traction on the nerve trunks. However, the manipulations referred to above were all performed by experienced surgeons, alert to the risks. Anatomical variations of the thoracic outlet may increase the risk of neural injury for shoulder manipulation.

We owe thanks to our colleagues for referring their patients to us, to Dr Wynn Parry for his assistance in their diagnosis and treatment, and to Mrs E Scott and Miss J. Margason for typing the manuscript. The authors chose not to respond to the request for a conflict of interest statement.

REFERENCES