RUPTURE OF THE AXILLARY ARTERY COMPLICATING ANTERIOR DISLOCATION OF THE SHOULDER

G. W. JOHNSTON and J. H. LOWRY, BELFAST, NORTHERN IRELAND

From the Fracture and Orthopaedic Service, Royal Victoria Hospital, Belfast

A woman aged fifty was first seen fourteen hours after injury, having fallen and injured her right shoulder. A few minutes after the injury she had noticed numbness, coldness and inability to move the arm and hand. Examination revealed an anterior dislocation of the shoulder with a large haematoma filling the axilla. The upper limb was cold, blue and pulseless, with complete flaccid paralysis of the whole arm and hand. Anaesthesia was present in the sixth, seventh and eighth cervical dermatomes. The first thoracic supply was unaffected. Treatment—The dislocation was easily reduced under general anaesthesia by Kocher's method. But since there was no change in the condition of the limb in the next two hours the shoulder was explored through a delto-pectoral incision, the pectoralis major muscle being divided at its humeral attachment and reflected upwards. The short head of the biceps and the coraco-brachialis were divided at their coracoid attachment. A large haematoma was cleared out, and when the axillary artery was exposed a complete rupture of the second part was found. Both ends of the artery were filled with thrombus. There was no evidence of previous disease of the vessel. The vein and that part of the brachial plexus which was exposed were uninjured. It was decided to ligature the two ends of the artery because it was thought that the lapse of sixteen hours from the time of injury was likely to preclude success from end-to-end suture. A segment an inch long, without collateral vessels, was resected from the proximal end and pulsation there returned immediately. The fused subscapularis tendon and joint capsule were found torn at their humeral attachment and were repaired with chronic catgut. The other muscles were sutured to their humeral and coracoid attachments and the skin was closed without drainage.

Progress—On the day after operation there was paraesthesia in the forearm. Slight active movements were possible in the fingers and hand. The skin circulation was good and the limb was warm, but there was no radial pulse. Within two weeks she had regained sensibility to pinprick over the whole arm, but two-point discrimination was still impaired. Meanwhile there had been a gradual improvement in muscle power (Medical Research Council grading: finger extension 2; finger flexion 3; wrist dorsiflexion and palmar flexion 4; elbow flexion (biceps) 3; elbow extension 2; deltoïd 1). Improvement continued over the next three months. Recovery of shoulder function was incomplete: deltoïd power was insufficient to raise the arm against gravity, but passive abduction was possible to 90 degrees, mainly by scapular movement (Fig. 1). There was full recovery below the elbow (Fig. 2). The radial pulse was still absent.

DISCUSSION

It is very unusual for dislocation of the shoulder to be complicated by vascular damage. Less than a hundred cases have been described since 1825. The damage reported varied from intimal damage with consequent thrombosis to rupture of a branch or of the main axillary vessel. In cases of rupture the common sites have been at the origin of the main branches—for example, the circumflex or the subscapular artery—or the main vessels at these junctions.

Most of the vascular injuries reported occurred during the nineteenth century, at a time when the reduction of dislocation of the shoulder was probably carried out more forcibly than would be usual now. Most occurred during reduction, which was often attempted many
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weeks after the actual injury (sixty-four out of ninety-one cases according to Calvet, Leroy and Lacroix (1942)). Stener (1957) found only twelve authentic reports of total rupture of the axillary artery caused by shoulder dislocation.

The outcome after vascular injury has been poor. Of the ninety-one cases collected by Calvet et al. (1942) no less than 55 per cent were fatal, and of the remaining patients most lost either the arm or much of its function. The poor prognosis has been reduced by anti-shock measures, chemotherapy and possibly by vascular grafting with anticoagulant therapy.

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Theoretically it should be possible to ligate the axillary artery and still preserve adequate circulation in the arm. In arterial injury caused by dislocation, however, the results have been poor after ligation. There are a number of reasons for this. Firstly, patients are usually elderly, and the anastomotic vessels may be narrowed by arteriosclerosis. Secondly, the collaterals may be damaged at the time of injury or by the reduction. Thirdly, the pressure of a large haematoma may further embarrass the circulation. Fourthly, if the injury is associated with shock, the hypotension does not favour the opening up of these collaterals. And finally, the operative procedure may interfere with the collateral vessels.

There have been a few cases of end-to-end suture of the ruptured vessel, but the results have generally been disappointing. For instance, Drescher (1935) described a case in which arterial suture was followed by gangrene of the arm. Henson (1956), however, described a successful outcome in a seventy-two-year-old man. Stener (1957) had a similar good result in an eighty-seven-year-old man. Stener and Henson considered that advanced age is an indication rather than a bar to suture.

Trials have also been made with arterial grafting since Lexer (1907) reported bridging a defect of the axillary artery with a saphenous vein graft.

Ideally, arterial repair is the treatment of choice after complete rupture of the axillary artery. In younger patients, however, ligation is adequate and can be followed by a good result even after the lapse of many hours between the injury and surgery.

**SUMMARY**

1. A case is described of complete rupture of the second part of the axillary artery complicating anterior dislocation of the shoulder in a woman aged fifty years.
2. Interesting features were that the patient was comparatively young, that the rupture was a result of the dislocation and not of the reduction, that the axillary vein remained intact, and that a satisfactory circulation returned after ligation of the artery.

We should like to thank Mr R. I. Wilson who operated on this patient, and Mr R. J. W. Withers for his advice.

**REFERENCES**


