THE DIAGNOSIS OF SHOULDER LESIONS DUE TO INJURIES OF THE ROTATOR CUFF

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The diagnosis of tears of the rotator cuff of the shoulder by clinical examination alone presents considerable difficulty. It may be remembered that in diagnosing complete ruptures of the supraspinatus, Codman (1934) confirmed his diagnosis at operation in twenty-one cases; in nine he was wrong. His criteria for operation were severe and demanded certain physical signs, which probably meant that in many quite serious tears no operation was attempted.

![Fig. 1](image)

Normal arthrogram.

Although it is possible that surgeons to-day may be more accurate in their diagnosis on physical signs alone, it is obvious that further help is required. It may also be recalled that although Codman’s interest and renown were so great, he was never able to operate immediately after the injury because of late diagnosis, but he maintained that early suture should be a simple and successful operation. “Delay means retraction of the tendon and a much more serious problem.”

In spite of the ingenious methods of repairing retracted tendons described by Bosworth (1944) and McLaughlin (1944), it is evident that early, as well as accurate, diagnosis is desirable. This paper is an attempt to assess the value of two procedures: procaine injection
of the tender area over the tip of the humeral tuberosity in recent injuries, and arthrography. The value of the latter has been shown in the excellent papers of Lindblom and Palmer (1939).

Procaine injection—Patients suspected of a recent injury of the rotator cuff on clinical grounds are subjected to an injection of procaine. If this restores the power of voluntary abduction, up to 150 degrees or more, it is considered that a major lesion is unlikely and treatment is conservative. If injection does not increase the voluntary range, arthrography is performed. Arthrography—The technique involves the insertion of a short-bevelled needle through the clean skin one inch in front of the acromio-clavicular joint. The needle is directed downwards and backwards into the cartilage of the humeral head. Thirty per cent diodone is injected under radiographic control. If the opaque fluid enters the joint, but immediately flows out into the subacromial bursa, it is considered that there must be a large tear requiring operative repair (Figs. 1 and 2).

Reliability of the tests—Procaine injection is confined to early lesions. In this series, fourteen out of twenty-eight shoulders responded by an increased range; eleven did not; three were equivocal (Table I). Of the fourteen that had increased range twelve recovered completely. Of the other two, which were operated on, one showed a recent extension of a small tear; the second a small tear and stiff shoulder. Of the eleven shoulders that did not respond, seven had a large tear at operation or did not recover. Of the three equivocal cases, two recovered, one did not. This procedure, therefore, gives a good, though not completely accurate, indication, and may save an unnecessary exploration.

Arthrography was employed for forty-two suspected major tears (Table II). Of these, twenty-two were considered to show major tears; fifteen were subjected to operation; seven
either refused or were unsuitable on account of age or other factors. In fourteen operations the arthrogram findings were confirmed. In the exceptional case the patient had probably dislocated his shoulder and had confused the supraspinatus. More than half of these patients recovered good movement and power and lost their pain. The seven patients who did not have operation failed in every case to recover and only two improved. All cases have been

| TABLE I |
|-----------------|-----------------|-----------------|
| PROCaine INJECTION OF Recent INJURIES (Twenty-eight Cases) |
| Positive response | 14 | 12 | 2 |
| No response | 11 | 4 | 7 |
| Uncertain | 3 | 2 | 1 |

| TABLE II |
|-----------------|-----------------|-----------------|
| Arthographic diagnosis | Number of cases | Operation | No operation |
| Large tear | 22 | 14 | 1 | 0 | 7 |
| No tear | 20 | 2 | 0 | 15 | 3 |

followed up for at least one year. A positive arthrogram finding is thus an almost certain indication of a major tear requiring operation, and can be obtained without delay.

A negative arthrogram, or a plain radiograph showing an avulsion crack in the greater tuberosity, was obtained on twenty occasions. Fifteen of these patients recovered completely; two others were operated on for pain and the presence of a minor lesion was confirmed. Negative arthography is, therefore, a good contra-indication to operation, unless other factors require it.

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REFERENCES

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