RECURRENT DISLOCATION OF THE ELBOW

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A recent dislocation of the elbow is sometimes very unstable; recurrence must be prevented by splinting, and control radiographic examinations are required every few days until this danger has passed. But there appear to be only a few reports of the rare disability of recurrent or habitual dislocation of the elbow in the last eighty years since Albert described the first example in 1881 (Sommer 1928). The surprising feature of these few cases is the variety of attributable causes and the number of operations designed to remedy this disorder—twelve, including modifications, in the seventeen cases mentioned in this paper. The causes include fracture of the epicondyse, torn collateral ligaments, fracture of the coronoid at its base with upward displacement of the brachialis muscle, tears of the front of the capsule, congenitally shallow trochlear notch of the ulna (the normal is a semi-circle or arc of 180 degrees), osteochondritis dissecans, and fracture of the medial condyle of the humerus. No case of rupture of the biceps tendon has been reported as a cause.

The injury is not recorded in the large text-books of fractures and orthopaedic surgery except by Ombrédanne and Mathieu (1937) in their five-volume text-book. In Helferich’s classic book (1899—translated from the third German edition of 1897 by J. Hutchinson, Jun.) there is a footnote by the translator describing, as a cause of recurrent dislocation of the shoulder according to Duplay and Reclus, “separation of the capsule and periosteum in one piece from the neck of the scapula” which appears to be the first description of the lesion emphasised by Bankart. Also in this book is the drawing (Fig. 1) of a coronoid process fractured at the base, not the tip, and drawn upwards with the brachialis muscle. Such an injury is one of the causes of recurrent dislocation of the elbow, but this is not stated in the text, although there is a description of the ease with which subluxation can be produced by manipulation in recent dislocations when the coronoid process is fractured.

Albert (1881) reported the case of a ten-year-old boy with an epicondylar fracture. No operation appears to have been performed for the recurring posterior dislocation. Heusner (1894) described a recurrent posterior dislocation of the ulna and anterior dislocation of the radius in a boy of thirteen years with a shallow trochlear notch and a fracture of the epicondyse. He deepened the notch but apparently with a rather unsatisfactory result as regards movements (von Stapleomhr 1949). Von Rehn (1924) discussed the only reported anterior dislocation (age and sex of patient not stated) which he cured by a plastic operation on the front of the capsule, using two incisions to insert a free transplant of skin; there is a drawing of the operation and two photographs show normal function. Bloch’s (1900) patient, by von Stapleomhr’s (1949) account, was a nineteen-year-old boy with a six years’ history of repeated posterior dislocations. There was a loose body in the joint, apparentiy from an epicondylar fracture, which he removed, and the ligaments were slack.

Fig. 1
Fracture of the base of the coronoid process with retraction of the brachialis muscle—one of the causes of recurrent dislocation of the elbow (Helferich).
Peritz (1924) is quoted by Sommer (1928) as having classified the causes of recurrent dislocation of the elbow and described a case. The patient was a twelve-year-old idiot boy and, according to von Stapleomohr (1949), there was an old fracture of the medial condyle of the humerus with disturbance of growth, a small ulnar notch and laxity of ligaments. Sorrel (1935, quoted by Ombrédanne and Mathieu 1937) reported a postero-lateral dislocation in a boy of twelve years which he thought was the result of a torn medial ligament. He inserted a tibial graft posteriorly in the lower end of the humerus, and the free end of the graft lay along the lateral rim of the ulnar notch. But Reichenheim (1947) stated that Sorrel's patient was seventeen and had a congenital shallow troclear notch in both ulnae caused by deficient coronoid processes. The right elbow had been dislocated on eight occasions and the left elbow on four occasions.

Knoflach (1935) carried out an elaborate repair of the capsule in a girl of fourteen years with a posterior recurrent dislocation arising from injury and with laxity of the ligaments but no congenital defect. There is an illustration of his operation in the article. A long band of fascia lata was inserted through lateral and medial incisions around the lower end of the humerus, encircling the front of the elbow joint in a cruciate or double spica effect. He obtained a good result.

Milch (1936) described bilateral recurrent dislocations in a boy of twelve years with congenital shallow troclear notches; but he only operated on one side. He stated: "No one with whom the author has spoken has ever seen or heard of a similar case," which bears out the common view that this complaint is unusually rare. He inserted a boomerang-shaped tibial graft one inch in length into the coronoid process through a quarter-inch drill hole and thereby the curve of the notch was continued. At the end of the operation full flexion of the elbow was possible. Dzhanelidze and Usoltseva (1937) reported a case but no information is available according to Reichenheim. Gosman (1943) performed Milch's operation but used a square peg. The radiographs one year later showed some absorption of the peg but there had been no recurrence. The patient was a fifteen-year-old boy who had sustained dislocations since the age of three; there was no congenital abnormality but all the joints were hypermobile.

Reichenheim (1947) described an ingenious and physiological operation which he devised because he was unaware that any other procedure had been described. The patient, aged twenty-five years, had sustained an increasing number of posterior dislocations since the age of thirteen years. Radiographs showed striking shallowness of the troclear notch of the ulna caused by an ununited fracture of the tip of the coronoid process, and also a shallow groove on the articular surface of the trochlea, attributed to osteochondritis dissecans. The biceps tendon was cut near its insertion and sutured to the tough periosteum on the anterior aspect of the coronoid process by two silver wire sutures. Six weeks later the power of supination and pronation seemed to be little diminished, and the only limitation was that of extension, which was to 170 degrees.

Wainwright (1947) used a flat cortical graft, measuring half an inch by a quarter of an inch by three-quarters of an inch, in the coronoid region for a recurrent posterior dislocation in a boy aged twelve years who had sustained five recurrent dislocations after the initial injury (he possibly had a shallow olecranon fossa). The bone graft was cut from the subcutaneous part of the upper border of the ulna; the elbow was immobilised for two months and there was a good result despite slow absorption of the graft.

Von Stapleomohr's (1949) female patient aged thirty-four years had a shallow troclear notch which he built up from an arc of 112 degrees and a depth of 6-5 millimetres to 155 degrees and 9 millimetres by two separate iliac grafts inserted into the olecranon process and coronoid of the ulna; the result one year later was satisfactory. His paper describes some of the earliest reported cases and is valuable because some of the original sources are not available in this country.

Kapel (1951) reported two patients with recurrent posterior dislocation, one of which
he operated on and cured by taking a strip from the biceps tendon and threading it through a quarter-inch drill hole in the plate of bone separating the coronoid and olecranon fossae; the tendon was then sutured to the tip of the olecranon. A central strip of triceps tendon was pulled through the same hole and sutured to the coronoid process. Thereby cruciate ligaments were constructed which had prevented any recurrence for seven years. The technique appears to be complicated.

CASE REPORT*

A man aged twenty-eight years had dislocated the left elbow posteriorly four times since childhood; and there had been two dislocations within the last four months. He had reduced one dislocation himself; and the other was pulled back by a hospital orderly. The last two dislocations followed simple injuries. He complained that the elbow felt insecure. On examination there was excessive mobility of the elbow. Radiographs showed non-union of a fracture of the coronoid process (Fig. 2) and osteochondritis dissecans of the trochlear surface of the humerus.

Operation—Reichenheim’s method appeared to have the advantage that in a fall on the hand with the elbow extended there would be a powerful contracture of the biceps muscle to prevent a posterior dislocation; moreover the tendon lying in front of the trochlea and coronoid would act as a ligament restraining a tendency to posterior dislocation. The scarring caused by the attachment of the tendon to the base of the coronoid of the ulna would be an added factor as in recurrent dislocation of the shoulder treated by the Putti-Platt or Bankart’s

* This patient was shown at the meeting of the Australian Orthopaedic Association in Melbourne in June 1951, at which the Sims Commonwealth Professor, Sir Reginald Watson-Jones, was present.

THE JOURNAL OF BONE AND JOINT SURGERY
operation, or by any other procedure that causes adhesion in front, as Watson-Jones (1943) pointed out.

The coronoid region was displayed by Henry's exposure of the cubital fossa. The brachialis muscle was drawn up with the ununited coronoid process, which had broken off at the base; the fragment was removed. There was virtually no capsule in the vicinity. There was a groove on the trochlea resembling that seen on the posterior surface of the head of the humerus in recurrent dislocation of the shoulder or in osteochondritis dissecans. This appeared to be the result of dislocations, and also might encourage them. Repair of the capsule was impracticable. In the cadaver the normal capsule is thin, and dislocation is easily caused if strong hyperextension is first used to tear the capsule in front and the forearm is then pushed backwards with the elbow slightly flexed. The use of encircling fascia lata (Knoflach 1935), plastic repair of the capsule with skin or fascia (von Rehn 1924), construction of cruciate ligaments with strips from the biceps and triceps tendons (Kapel 1951), deepening

![Fig. 4](image1.jpg)  ![Fig. 5](image2.jpg)

Photographs illustrating full range of flexion and extension after operation. There is no loss of power of supination.

of the trochlear notch by a bone graft (which is liable to be absorbed), are rather cumbersome. Operations on the cadaver showed that the main difficulty of Reichenheim's operation was to anchor the biceps tendon firmly to the base of the coronoid in the deep wound. But if the tendon were attached to the posterior surface of the olecranon, after being passed through a drill hole in the coronoid (Fig. 3), the attachment would be very strong. After this procedure on the cadaver the elbow could not be extended beyond 100 degrees because about one inch of tendon was buried in the drill hole in the ulna, and this meant a corresponding shortening of the tendon. The same difficulty was noticed at operation, and caused me anxiety as to whether the forearm could ever be fully extended; moreover the suturing of the skin incision was made difficult. But after four months there was full extension, and all movements were normal (Figs. 4 and 5). The power of supination was unaffected. There had been no recurrence two years after the operation.

REFERENCES


