RECURRENT DISLOCATION OF EXTDNOR TENDONS IN THE HAND

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Dislocation of a tendon of extensor digitorum from its median position on the metacarpal head during flexion of the metacarpophalangeal joint is a rare occurrence, though from its exposed position it will not often pass unnoticed. Sir James Paget mentioned three cases in 1875 and Marsh a further four in 1896, since when its pathology and treatment have received occasional mention and discussion. Usually the report has been on the basis of a single personal case.

The following cases are of interest in that the nature of the primary lesion is demonstrated, together with a satisfactory method of operative repair. Other methods of treatment and the probable etiology are briefly discussed.

CASE REPORTS

Case 1—A sixteen-years-old boy gave a history of having sustained a sharp blow on the dorsum of the proximal phalanges of his right hand six years before, when holding a toy gun. Since then, the extensor tendon on the third metacarpal head had been dislocating to its ulnar side each time the metacarpophalangeal joint was flexed, and returning to the normal position when it was extended. This had caused few symptoms until recently, when an increased amount of writing had been followed by aching and throbbing in the affected knuckle. On examination, the dislocation of the tendon with flexion of the joint was obvious. The function and anatomy of the hand were in other respects normal.

Operation—Exploration through a longitudinal incision revealed an oblique tear in the radial side of the proximal border of the extensor aponeurosis (Fig. 1) which allowed the tendon and aponeurosis to slip off the metacarpal head as the joint flexed, leaving it covered only by synovial membrane and extra-synovial connective tissue (Fig. 2). The aponeurosis was sutured, but with flexion of the finger the sutures cut out and the dislocation recurred. A conveniently situated junctura tendinum was therefore separated from its attachment to the ring finger tendon and brought over to be sutured down in the line of the torn aponeurosis (Fig. 3). This effectively prevented any further dislocation (Fig. 4). After suture of the skin the digit was immobilised on a plaster splint in a position just short of full extension for three weeks. The finger soon regained a full range of movement and normal strength. There was no sign of recurrence one year later.

Case 2—A twenty-eight-years-old woman injured her left hand thirteen years ago when jumping over a vaulting horse. The hand was wrenched as she continued to hold on to the horse after her body had passed over it. She sustained a greenstick fracture of the fourth metacarpal, and the whole hand was bandaged up with the fingers fully flexed for two weeks. She remembers that it took a long time and much effort before she recovered a full range of movement in her fingers. Since then, she had noticed the extensor tendon of the ring finger occasionally slipping to the ulnar side of the knuckle, and to this she attributed aching discomfort between the fourth and fifth metacarpal heads after much work with the fingers, as in dentistry or piano playing.

On examination, a partial dislocation of the ring finger extensor was produced fairly easily by resisting the patient's attempt to extend the partly flexed finger while forcing it a few degrees towards the ulnar side (Fig. 5). The photograph shows that the middle finger tendon was also unstable and moved well to the ulnar side of its knuckle.
Case 1—The condition found at operation with the metacarpophalangeal joint in extension (Fig. 1) and in flexion (Fig. 2).

Case 1—After repair with junctura tendinum from the radial side of the tendon. Figure 3—Finger extended. Figure 4—Finger flexed. Inset shows details of the repair.
The discomfort produced in this patient was less than in the first case because the tendons did not invariably dislocate with flexion of the joint and because the smaller prominence of the knuckles of the female hand considerably reduced the range of abnormal movement.

**DISCUSSION**

**Anatomy**—The metacarpo-phalangeal joint is a simple diarthrodial hinge joint with a small range of lateral movement in extension which diminishes to none in full flexion. It has strap-like lateral ligaments and a thick fibrocartilaginous palmar ligament. The dorsal capsule is completed by the extensor aponeurosis, formed from the common extensor tendon and the lateral expansion and the insertions of the lumbrical and interosseous muscles, the whole being separated from the synovial membrane by a loose layer of areolar tissue which permits free movement in the line of the tendon. The interosseous muscles usually have attachment also to the base of the proximal phalanx and a slip to the ligaments of the adjoining joint (Bunnell 1942). With the finger extended the extensor aponeurosis ends proximally with a clear-cut curved border one centimetre proximal to the joint line; in flexion it moves distally to lie opposite the middle of the articular surface on the end of the metacarpal. Proximal to this, on the dorsal surface of the hand, the tendon lies in loose areolar tissue between skin and deep fascia; here the only checks to its lateral movement are oblique and transverse tendinous and fibrous bands of varying size and strength.

**Etiology**—The dislocation arises because of abnormalities in the shape of the extensor aponeurosis, and these may be traumatic, congenital or pathological in origin. Any one or a combination of these factors may be present in a particular case.

**Injury**—In the recorded cases the patients have most often given a history of a violent blow on the dorsum of the incompletely flexed fingers, forcing them into ulnar deviation. Curchod (1916) reported the case of a man who wrenched his fingers into ulnar deviation when falling, as in Case 2. Direct injury to the knuckle has not been a factor in these cases, except possibly in that of Razemon (1930), in which the condition was caused by a left hook when boxing; but it is equally possible that this man may have punched with his fist incompletely clenched.

While studying the anatomy of this region in preserved hands, I have been able to reproduce exactly the lesion seen in Case 1 by forcing flexion and ulnar deviation of the metacarpo-phalangeal joint against the resistance of the formalin-hardened extensor muscles. This lesion is an oblique longitudinal tear in the proximal border of the extensor aponeurosis (Fig. 6). It is not longer than half a centimetre, but in two hands, from different subjects, it was similarly produced and was followed by a typical tendon dislocation (Fig. 7). Ulnar deviation is essential to the production of the lesion, for in the hands examined the tendon was not dislocated when the fingers were flexed with their long axes remaining in the line of the proximal part of the tendon, even after the aponeurosis was torn. It is interesting
that as the stability of the tendon on the knuckle appears to diminish with flexion of the joint, there is a decrease in the range of lateral joint movement.

It seems probable, therefore, that most traumatic lesions are produced by a force which causes further flexion and ulnar deviation of the already partly flexed metacarpo-phalangeal joint when the opposing extensor muscles are contracting strongly.

Congenital anomalies—There is much variation, both in size and shape, between tendons in the same and in different hands. That this may be a factor favouring dislocation is suggested by the different incidence of dislocation in different fingers. Of thirteen recorded traumatic tendon dislocations, Razemon (1930) found that ten had occurred in the middle finger and three in the index fingers. Thus it may be presumed that the tendons in the radial two fingers are less stable than those in the ulnar pair—perhaps from differences in shape, or from the normal ulnar deviation of the radial fingers when they are adducted to the midline. However,

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(1940) in which the dislocation occurred from resting the weight of the body on the dorsum of the partly flexed fingers on a table.

Pathological changes—The degenerative changes of rheumatoid arthritis may allow the extensor tendons to dislocate (Fig. 8). Fearnley (1951) stated that dislocation is usually seen only in advanced cases with much ulnar deviation and stressed that it is the result and not the cause of the ulnar deviation. However, in Levy’s case, attributed to rheumatoid arthritis, there was only swelling of the joints without severe deformity, and, six years after the dislocation, the patient still had a full range of normal movement in the metacarpo-phalangeal joints. It is, of course, quite possible that the dislocation was coincidental in this patient, in that she had a tendon which was congenitally unstable before the development of the arthritis. It is a fact, however, that in a number of the recorded traumatic cases the patient has complained of ulnar deviation of the affected finger when the tendon was dislocated, and one would expect that the coincidence of traumatic or congenital dislocation with arthritis deformans would hasten the development of the characteristic arthritic deformity.

Treatment—Many persons with this condition probably do not find it sufficiently troublesome for them to seek medical advice; others, as in Case 2, become so accustomed to the occasional pain and discomfort that they prefer it to the inconvenience and uncertainty of operation. None of Levy’s four patients wished to have the hand treated, and Mouchet (1942) did not advise any treatment in his case, in which the tendon remained permanently dislocated and caused no symptoms.

Most patients with traumatic lesions probably complain of some pain and discomfort at times, and in some there is difficulty in completing the movement of extension until the tendon snaps or is pushed back into its normal position. They may also complain that when the tendon is dislocated it pulls the finger into ulnar deviation, in which position it interferes with the movement of the adjoining finger. These patients are generally glad to get some relief from their symptoms.

Curched (1916) and Silfverskiöld (1928) each reported a case in which the metacarpo-phalangeal joint was immobilised in extension immediately after the injury, with subsequent return of normal function without symptoms; though in each case a slight recurrent subluxation of the tendon remained. It may not always be easy to recognise this lesion in the presence of haematoma and swelling immediately after the injury; but the operative approach is so simple that when the condition is recognised it would be reasonable to make a small incision and to restore the anatomy to normal with two or three sutures before applying the splint.

Haberern (1902) dissected the tendon from the aponeurosis and reattached it to the radial side with a flap from the ulnar side sewn over the tendon. Success with this method has also been recorded by Razemon (1930) and Straus (1940). Bunnell (1948) prevented
dislocation by simple radial transplantation of the tendon on the aponeurosis and it seems probable that the flap in Heberden's operation is unnecessary.

Repair or replacement of the defective half of the proximal border of the aponeurosis may be accomplished with any suitable tissue available. Bunnell threaded a length of palmaris longus tendon across the extensor tendons, suturing down the graft midway between each tendon; and Fitzgerald (1939) and Cutler (1942) used a strip of fascia for a similar purpose. The use of some locally available tissue is less mutilating and less troublesome, and the vinculae, where available, are an obvious choice. Failing this, a strip of the tendon itself turned down and across should be sufficient to effect the repair without in any way interfering with the normal function of the joint or tendon.

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REFERENCES


