SMITH’S AND BARTON’S FRACTURES
A Method of Treatment

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In 1847 Robert William Smith published in Dublin his account of the fracture which ever since has borne his name. He described a fracture of the lower end of the radius, half to one inch from the articular surface, in which the lower fragment and the carpus were displaced forwards in relation to the forearm. The case from which Smith’s original drawing was made was that of a patient who fell on the back of the hand “in endeavouring to save himself from being run over by a car.” In spite of the contemporary sound of this, it is probable that the vehicle was a horse-drawn trap. The drawing was accompanied by a beautifully accurate account of the deformity.

Smith considered it an exceedingly rare injury—as, presumably, was such an accident in the streets of Dublin in 1847—but today fractures of this reversed Colles type are by no means uncommon. Emmett and Breck (1958) found twenty-three Smith’s and 448 Colles’s fractures over a period of nineteen years.

Common fractures are caused by common injuries, and as accidents become more bizarre and varied the uncommon fractures are seen more often.

Nine years earlier than Smith’s article, in 1838, John Rhea Barton of Philadelphia had described anterior and posterior fracture-dislocations of the wrist. Posterior fracture-dislocation is a rare injury: Böhler (1943) found only seven dorsal fracture-dislocations in 448 wrist injuries. In fact, Barton’s posterior fracture-dislocation was probably a Colles’s fracture.

However, the anterior fracture-dislocation of the wrist in which a triangular fragment of the anterior margin of the lower end of the radius is sheared off and displaced forwards and
proximally with the carpus should strictly be known as a Barton's fracture. It was given this
name for the first time in 1860 by Hamilton in a work entitled *A Practical Treatise on Fractures
and Dislocations* and published in Philadelphia.

This injury has come to be classed as a Smith’s fracture by most subsequent writers on
the subject, and Thomas (1957) included Barton’s fracture as one of his three types of Smith’s.
The three types described by Thomas were: Type 1—an oblique comminuted fracture occurring
usually in older women (Fig. 3); type 2—the Barton’s fracture (Fig. 1); type 3—a more
transverse fracture occurring in younger subjects and due to more severe injury (Fig. 6). In
fact, one type merges into another as the obliquity of the fracture line diminishes and becomes
more horizontal and the size of the distal fragment increases. Although Smith’s original
account was of a reversed Colles’s fracture, it seems reasonable to consider this and the fracture-
dislocation of Barton as similar injuries.

**DISCUSSION**

A fall on to the back of the hand must be an unusual cause of the injury and, as Thomas
(1957) and Flandreau, Sweeney and O’Sullivan (1962) point out, a more likely mechanism is
a fall on to the outstretched supinated hand. In the young, the injury takes the form of an
anterior fracture-separation of the lower radial epiphysis. Whatever the type of the fracture,
the carpus and the lower fragment are displaced forwards and more or less proximally. The
ulnar styloid process may or may not be involved and impaction seldom occurs. The cortex
of the anterior aspect of the lower radius is thin and brittle and often becomes comminuted.

This forward displacement is easily corrected by manipulation but it is difficult to maintain
the correction. Similar difficulty is, of course, encountered in Colles’s fractures, but in the
latter displacement is associated with comminution of the posterior part of the fracture into
fragments so small that when the fracture is reduced a gap may remain at the back which
cannot easily be held open. Unless the resulting deformity is unacceptable, the impaction of
a Colles’s fracture is often best left unreduced, both because redisplacement is so common
and also because good function is compatible with malunion. In a Smith’s fracture, however,
malunion interferes considerably with the range of rotation and so with function.
TREATMENT

Mills (1957) described a method of manipulation which was successful in restoring the alignment of the joint, and he and Thomas advised locking the fragment in place by immobilising the forearm in full supination in an above-elbow plaster for five to six weeks. Flandreau, reviewing thirteen cases, found no redisplacement or loss of reduction in those treated in full supination, and there seems no doubt this is an excellent method of holding the reduced position. Nevertheless, recovery of a full range of rotation in forearms immobilised in this position is often slow. If flexion and extension are permitted by hinging the plaster at the elbow, while supination is maintained, as recommended by Plewes (1962), recovery is more rapid.

Although this has been shown to be a satisfactory method of treating this fracture, it is impossible for the patient to make any functional use of the hand during immobilisation.

Cauchois, Duparc and Potel (1960) described internal fixation as a method of treatment of these injuries. The purpose of this paper is to suggest that these fractures are best held in a reduced position by using a small buttress plate secured to the lower radial shaft. No screws are inserted in the thin and often comminuted cortex of the lower fragment and the distal part of the plate is used only as a buttress to support it without the need for any external splint.

OPERATION

A vertical incision is made over the radial side of the front of the lower forearm. The wound is deepened to the pronator quadratus muscle between flexor carpi radialis on the lateral side, and palmaris longus and the median nerve on the medial. Flexor pollicis longus is retracted laterally and the sublimis tendons medially, and the pronator quadratus fibres are divided to expose the inferior surface of the lower end of the radius. The fracture is reduced and a small plate, angled to conform with the surface of the bone, is screwed to the intact shaft. The distal part of the plate acts as a buttress supporting the reduced fragment and no screws are put in it. Recently a small T-shaped plate has been designed which is fixed...
to the bone by screws in the vertical limb of the T. The skin is closed and a pressure bandage applied. Mobilisation of the fingers starts at once and movement of wrist and forearm are begun as soon as the pressure dressing is removed.

This method has been in use for the last fifteen years and the results have been very satisfactory. No fracture has become displaced and movements have been rapidly regained. In one case the plate was removed later because it had been inserted too far distally.

Although the Barton’s type of anterior marginal fracture-dislocation seems the most satisfactory type of case for this method of treatment (Figs. 1 and 2), the oblique and transverse types of Smith’s fractures are also suitable (Figs. 3 to 8).

**SUMMARY**

1. A method of treating Smith’s fracture and Barton’s anterior fracture-dislocation of the wrist by internal splintage is described.
2. The application of a special buttress plate fixed to the lower anterior aspect of the radius is advocated; no external splintage is used.

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**REFERENCES**


Böhlér, L. (1943): *Treatment of Fractures*. Bristol: John Wright & Sons Ltd.


