

## Clinical and other Notes.

### FRACTURE OF THE SCAPHOID. A STUDY OF FORTY CASES.

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IF one opens a standard work on surgery of ten years ago, it is remarkable how small a space is given to fractures of the carpal scaphoid. One receives the impression that it is a comparatively rare fracture. This was doubtless due to the fact that X-rays were used less than they are now, and to the relatively mild symptoms sometimes evoked by such a fracture. Even to-day the matter is not entered into very fully, and the relative value of conservative or operative treatment appears to be based on personal opinion rather than on the results of following up cases.

I recently came across an American work of some size dealing entirely with fractures in the region of the wrist. The author certainly dealt with fractures of the scaphoid at considerable length, and his conclusion was that, except in a few cases, better results followed operative than conservative treatment.

Despite this view, he admitted that a good functional result was not to be expected for six months after operation. He quoted in support of his dislike of conservative treatment some statistics, collected in the German Army, which were as meagre as they were gloomy. I regret that foreign service prevents me from quoting the exact figures mentioned; but, as well as I remember, there were six cases treated without operation, of which none was ever fit for full duty and three were invalided.

Such results were a surprise, and it occurred to me that, before accepting them and making a practice of excising every fractured scaphoid that came under one's care, the matter should be further investigated. I was unable to find any other reports based on following up the after-histories of men who had sustained this fracture, so decided to try to collect a sufficiently large number of cases to justify drawing conclusions which might be of value.

The first difficulty encountered was the fact that patients who have sustained a fracture of the scaphoid are rarely admitted to hospital. The annual admission rate in the whole Army for the three years 1927-29 averaged only twenty-five. I therefore sought the aid of the X-ray department at the Cambridge Hospital, Aldershot, and Major J. H. Baird R.A.M.C., kindly gave me access to his records as well as other help.

The first point of interest in the investigation was the realization of how relatively common the fracture in question is. During the years

1925 to 1927 it was demonstrated in 102 patients—an average of thirty-four fresh cases per annum. Those years were selected because I hoped that they would be sufficiently recent to enable the cases to be followed up, and sufficiently distant for the results of the fractures to be stabilized.

All cases who were still in the Aldershot Command were sent for and examined. These proved to be few in number, and considerable difficulty was experienced in tracing the parts of the world to which the remainder had been moved. In the case of men who could be traced, their new M.O.s were written to and asked to furnish a report, and many of them were kind enough to supply the information. A questionnaire was finally sent to such men as had been transferred to the Reserve, asking for the presence or absence of disability in the wrist. From these various sources forty replies were received—a small number, but, it is hoped, large enough to be of some value.

Before dealing with the results of these cases, I should like to refer to the invaliding rate of the accident. During the years 1927-28-29, six men were invalided out of the Army as a result of this fracture—an average of two per annum. The fracture was found to occur in the Aldershot Command alone on an average 34 times per annum, so that in the whole Army there must be an annual average of about 130 cases. From this it emerges that in the British Army the invaliding rate from this cause is under two per cent, not an alarming figure. It is impossible to say how many cases have been operated upon, but in the Aldershot series of forty there was only one. I operated upon another myself, but it is too recent for the end-result to be included in this article.

The above facts would appear to show that this fracture does not as a rule result in serious permanent disability; but more detailed information as to results is available in those cases X-rayed in the Cambridge Hospital, of which the subsequent histories were obtained.

The results have been classified as follows:—

*Perfect.*—Where there is full range of movement, and no loss of power.

*Good.*—Where there is some decrease in range of movement—usually dorsiflexion—but no loss of power and the patient is unhampered in his normal occupations.

*Fair.*—Where, in addition to decreased range of movement, there is some pain or weakness in the limb, and the soldier's efficiency is slightly impaired.

*Bad.*—When the disability renders the patient unfit for service in the Army.

Under the above headings the forty cases can be classified as follows: Perfect 22, good 12, fair 5, bad 1.

The one case which was operated upon is not included in the above—it was a perfect result.

These seem gratifying results, and an attempt was made to correlate the nature of the injury with the end-result. This was not very satisfactory,

as in the older cases the films could not be traced or had perished, and reliance had to be placed on the brief notes in the X-ray register.

Reference to the nature as well as the site of the fracture was found in thirty cases, as follows:—

Description in X-ray register	Perfect	Good	Fair	Total
"Crack" .. ..	3	..	..	3
"No displacement" .. ..	7	4	1	12
"Good position" .. ..	5	5	3	13
"Bad position" .. ..	1	..	..	1
"Considerable displacement" .. ..	1	..	..	1
	17	9	4	30

In the great majority of the cases there was some form of simple transverse fracture. It is remarkable that the two in which the X-ray appearance was unsatisfactory had such good results. The first of them was operated upon, and the second was nine weeks in a splint.

This investigation appears to prove that in the majority of cases some form of conservative treatment gives satisfactory results. Unfortunately, information as to treatment was included in only twenty-eight replies, and some of the results are surprising.

Type of treatment	Perfect	Good	Fair	Bad	Total
No treatment .. ..	1	4	2	1	8
Massage .. ..	2	1	2	..	5
Bandage .. ..	1	..	1	1	3
Splint and massage.. ..	7	4	1	..	12
	11	9	6	2	28

Of the "bad" results, the first was not diagnosed till late, and was invalidated. The second one was operated upon, with a subsequent perfect result.

The cases marked "No treatment" were those in which the fracture was not diagnosed at the time, but were X-rayed at a later date, either because the symptoms of the "sprain" seemed slow in clearing up, or for some subsequent injury to the wrist.

Though the above figures are too small to warrant any positive conclusions, they contain some points of interest. First, that good results may be found even when treatment is absent or superficial. The case with a perfect result but no treatment sustained the fracture in 1922 through the junctions between the ulnar and middle thirds of the bone. Despite examples like this, the results bear out the belief in the value of splinting. Of the sixteen cases in which splints were not employed, nine (fifty-six per cent) were good or perfect, whereas of the twelve cases which were treated by splints, eleven were good or perfect, and the remaining case fair.

With the above excellent results from conservative treatment, it at first sight seems difficult to understand why some authorities are in favour of operative treatment as a routine. The reason is probably a matter of

diagnosis. The symptoms of a simple fracture of the scaphoid may be little worse than a sprain, so that if the patient's work is not of a strenuous nature, he may carry on after a few days' rest. In the Army, however, most men's work is of a fairly heavy nature. Consequently the soldier usually takes the first opportunity of showing his wrist to a medical officer, who sends him to be X-rayed forthwith, or as soon as the persistence or recurrence of symptoms rouses his suspicions.

Further, in civil practice, though possibly the X-rays are not employed so freely on sprained wrists as in the Army, these cases are presumably dealt with successfully by the general practitioner in the majority of cases, and still fewer find their way into a civil than into a military hospital. It is probably only the severe or complicated case which is ever seen by the orthopaedic surgeon. Such patients presumably have already been treated on conservative lines without success, and an operation may be the only treatment available. An orthopaedic surgeon, therefore, is more likely to have a low opinion of conservative treatment than a general surgeon, who treats the straightforward as well as the complicated cases.

It is sometimes stated that unless bony union occurs, the distal fragment will die and form an aseptic but irritating foreign body. Also that the access of synovial fluid to the fracture site prevents such union.

In this series, eight of the forty cases showed union by bone. In six of these the position of the fragments was recorded, and in every case it was good, so that possibly the synovial membrane was not ruptured, and thus union occurred. In seven the results were recorded. These comprised two perfect, two good and three fair, results which compare unfavourably with the cases in which there is no record of osseous union having taken place. It would appear from this that bony union is by no means essential to a perfect result.

*Treatment.*—It has been shown above that the highest percentage of perfect results followed the use of splints; next came massage, so that the employment of some form of splint and massage is certainly indicated; but what type of splint, and for how long? In five of the perfect results the duration of splinting is recorded, and it averages over seven weeks. This certainly appears an unduly long time, but it shows that no harm can result from erring on the side of caution.

It is stated that dorsiflexion of the wrist tends to separate the fragments and so delay union; but as incomplete dorsiflexion is the commonest and often the only disability following this fracture, it seems reasonable to use a "cock-up" splint, provided the dorsiflexion can be gained without pain or force. Whatever type of splint is used, it should control the wrist, but not the fingers and thumb, and should be worn for three or four weeks in simple cases. If there is marked displacement, the duration of splinting should be doubled. It should be accompanied by massage without movement and followed by both.

Operation should be reserved for cases with marked displacement or

comminution and for those in which disability persists in spite of the above treatment. The removal of the whole bone is not an easy operation, and its benefit is unlikely to be apparent before the lapse of several months.

*Conclusions.*

- (1) Fracture of the carpal scaphoid is a common injury.
- (2) Treatment should be conservative, and the best results follow rest on a splint for three or more weeks.
- (3) Though osseous union does occur, equally satisfactory results may be obtained in its absence.
- (4) Operation should be reserved for special cases.

I wish to take this opportunity of thanking not only Major J. H. Baird for giving me access to his X-ray registers, but also the numerous medical officers in various parts of the world who assisted me by examining and sending me reports on the after-histories of cases, and in several cases recent radiograms as well.

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MULTIPLE MYELOMATA.

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It was in 1847 that MacIntyre invited Bence-Jones to report upon the urine of a patient suffering from an undiagnosed illness, and as a result of his examination a peculiar protein, Bence-Jones protein, was revealed.

The patient subsequently succumbed, and at the autopsy a condition of multiple myelomata was found.

In 1889, Kahler of Prague fully described the disease and noted the association of myelomata in the bony system with the unusual protein in the urine, and in consequence this clinical entity has been named Kahler's disease.

In 1900, T. R. Bradshaw reported another case which he called myelopathic albumosuria, at the same time quoting eleven previously reported cases. Later, in 1904, Parkes Weber reported a case and made reference to some forty cases which he had collected.

The disease in its typical form is characterized firstly by the presence of myelomata in the bone-marrow, the myelomatous tissue being either diffused throughout the marrow substance or forming localized swellings or tumours, and secondly by the presence in the urine of Bence-Jones protein.

The marrow of the affected bones is invaded by a diffuse pulp-like growth, and the compact bone becomes reduced to a thin shell; in some cases localized outgrowths from the bone may form, resulting in nodules or maybe large tumours covered with a thin bony shell.