REPORT ON THE FRACTURE CLINIC OF THE KENT AND SUSSEX HOSPITAL

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In February, 1935, the B.M.A. published the Report of the Committee on Fractures. Suggestions were made therein for running in a hospital an ideal fracture clinic and fracture service generally. Following that the Kent and Sussex Hospital Clinic was reorganized, and I give below the results obtained in the first year of working.

Hospitals vary in size and to some extent in methods. What is possible in one is not possible in another. In this hospital there are 208 beds, and extreme specialization is not possible. There are many provincial hospitals of similar size, and an account of the organization of our clinic may be of interest to them. It has worked very smoothly.

Organization

The clinic is an out-patient clinic; cases requiring admission come in under the "surgeon of the week." Those cases coming to me during my own "take-in" week have received after-treatment in the clinic. All fracture cases are seen and treated in the first instance by whoever is on duty in casualty. Usually it is the casualty officer, but it may be one of the house-surgeons. The cases are then referred to the fracture clinic, which is held on one afternoon a week. The new cases and their *x*-ray films are there seen by me, and data are entered in a register which I had arranged as follows.

Date	Name	Address	Age	Fracture and Position

On the page opposite—

Date of Fracture	Position After Reduction	Remarks	Result		Date of Discharge
			Anatomical	Functional	

The patient's card is then initialled by me opposite the date of that attendance. This procedure has the double advantage that it makes certain that all cases have been seen by me and, whether for discharge or for any other matter, it makes reference to that patient easy, since it is only necessary to turn up the register at the date when the card was initialled.

The casualty officer is present at the clinic and sees the old cases. I can therefore discuss with him any case that has not been properly reduced, or in which the fixation is unsound or inadequate, or he can discuss any case of difficulty with me. All cases are referred to me for discharge, and I enter the result.

Thus the casualty officer has charge of the case from start to finish, and from his point of view the system is satisfactory. If he has been unsuccessful in his reduction or fixation he can learn where he was wrong and obtain by the end of his time a sound working knowledge of the treatment of fractures.

When I started the register I wrote up the results simply as percentages, but it was not found wholly satisfactory, since it is difficult to assess cases fairly. Now I add a note to anything under 100 per cent. stating what is wrong. The anatomical results are assessed by eye and ruler. This method is more instructive than simply repeating the *x*-ray findings after reduction. It shows, for example, what degree of angulation in, say,

a radius and ulna is compatible with a perfect result; also that in some, especially Colles fractures in which the *x*-ray suggests a perfect reduction, a very slight degree of deformity can be detected by ruler after union.

Analysis of Cases

Below are tabulated the results of the 268 cases treated over a period of one year. The times represent from the date of fracture to date of discharge; only those who were seen by me for discharge are included.

Table of Results

Type of Fracture	Total Number	Completed Treatment	Average Time	Shortest Time	Longest Time
			Weeks	Weeks	Weeks
Metacarpus and phalanges ...	20	12	5.3	3	10
Carpus ...	4	4	37	16	50
Colles ...	46	41	5.1	3	14
Lower epiphysis of radius ...	12	9	5.1	3.5	8
Styloid radius...	10	7	5.6	4	11
Compression green-stick lower end radius ...	7	5	3.7	3	5
Shafts radius and ulna ...	38	34	7.7	4	17
Head and neck of radius ...	6	6	5.6	3	8
Olecranon ...	5	4	6.2	3	8
Coronoid process of ulna ...	1	1	6	—	—
Lower end humerus	20	19	6.25	3.5	13
Shaft humerus ...	1	1	7	—	—
Upper end humerus	6	4	8.6	4.5	14
Clavicle ...	15	13	5.8	3	20
Phalanges of foot ...	6	5	5.2	4	6.5
Metatarsus ...	5	3	7.3	6	10
Tarsus ...	9	8	24.5	8	45
External malleolus ...	14	13	7	4	11
Internal malleolus ...	3	2	5.3	4	6.5
Pott's fracture ...	9	7	13	7	17
Shaft of fibula ...	4	4	7.3	4	12
Tibia and fibula ...	14	10	13	6.5	25
Fractures about knee-joint ...	9	8	17.5	6	40
Mandible ...	1	1	3.5	—	—
Ribs ...	2	0	—	—	—
Body of vertebra ...	1	1	16	—	—

Comments on Individual Fractures

Metacarpus and Phalanges.—The results appear better in the above tables than they actually were. For one thing several bad cases failed to complete treatment. For another, on going into the full details of those that were discharged, in only one-third are the anatomical results perfect, and in only one-half are the functional results perfect. The rest vary from 80 to 90 per cent.

Carpus.—These hardly form a fair series, because in all the *x*-ray films there was evidence that the fracture was not of recent origin, although from the patients' point of view the injury was recent and there was no definite previous history of injury. There were three fractured scaphoids and one fractured semilunar. Two of the former appeared to unite after prolonged fixation in a plaster cock-up, but it is too early yet to speak of the ultimate result. In the case of the semilunar and the third scaphoid I excised part of the fractured bone as they showed no improvement with fixation. The results are satisfactory so far.

Colles Fractures.—All cases were treated with the dorsal plaster slab. The majority were reduced under gas, a few with a local anaesthetic. I did many of the second reductions for cases that had not been properly reduced under a local, as then one could say that one merely had to make a slight adjustment, thus avoiding the idea in the patient's mind that the fracture had not been properly "set." Once I did one of these using a Thomas wrench without the patient objecting. All the Colles patients were told to go home and use their fingers. The majority did; one or two girls assisting in shops continued their work the whole time. Some patients would not move their fingers, and this delayed their recovery, until I learnt fully Böhler's after-treatment, which has not been sufficiently stressed in this country. At the Accident Hospital in Vienna there is a form of pulley apparatus in nearly every ward and in the out-patient department, and patients were continually made to work every joint that was not immobilized. On my return I therefore made it a rule that all patients who did not use their fingers from the start should go to the massage department in their plasters and be taught to work a pulley apparatus and do finger exercises. Of the forty-six fractures only five occurred in men. Of the forty-one cases I discharged, thirteen were 100 per cent. anatomical and functional, eighteen were less than 100 per cent. in one or both, but not less than 90 per cent. By that I mean anatomically one could detect deformity with a ruler, though it might not be noticeable on looking at the wrist. Functionally there might be some limitation of movement or pain. The majority of these in another month would have been functionally perfect. The ages of the ten less good results ranged from 60 to 81, with two exceptions. Both the latter had apparently perfect reductions, but some degree of deformity recurred.

Lower Epiphysis of Radius.—I classified these separately and was interested to find that the average time was identical with the Colles fractures. The results were all very good.

Styloid of Radius.—Except for one case, which was complicated by a fracture of two metacarpals, the average time would have been 4.7 weeks. One patient was at work in his plaster all the time. Results all 100 per cent.

Compression Greenstick Fracture of Lower End of Radius.—By this I mean the common incomplete fracture in the lower end of the shaft of the radius occurring in children, in which there is no deformity, or at most one degree of angulation, but a transverse ridge shows in the x-ray all round the bone in that situation. Results all 100 per cent.

Shafts of Radius and Ulna.—All but seven of these occurred in children. In twenty-nine both bones were broken. All were treated with the Böhler type of plaster from the middle of the upper arm to below the wrist, and all used their fingers from the start. One adult managed to work in the hop-fields in her plaster.

There were only two open operations: one for a radius three weeks old in an adult, which was merely reduced and put in plaster; the other for a fractured radius and ulna in a girl of 15 in which the fracture of the ulna was compound, with the end of the shaft projecting from the wound. The projecting portion was cut off, the wound excised, and the whole completely enclosed in plaster. She was discharged at the end of eight weeks with a 100 per cent. anatomical and functional result.

Nearly all the results were very good both anatomically and functionally. In one-third of the cases there was slight limitation of pronation or supination on discharge. I followed up several at a later date, and all had or were getting full range of movement. There is one point in the application of these plasters worthy of mention—namely, the ease of causing obstruction to the circulation by an edge of bandage crossing the fold of the elbow anteriorly when fixing the posterior slab.

Head and Neck of Radius.—There was no marked displacement in any of these cases. They were treated in a collar-and-cuff sling in full flexion. Results perfect.

Olecranon.—Except for one case, which I had wired, these were all minor cracks with no displacement. Three of them were still five degrees short of full extension on discharge; the others had full range.

Lower End of Humerus.—All these occurred in children except one case—namely, an external epicondyle complicating a dislocated elbow in an adult. They were all treated by a collar-and-cuff sling in full flexion. A plaster may have the advantage in an adult that the shoulder and fingers can be moved all the time, but in a child this is less important; moreover, in a child a plaster is comparatively large and heavy. All the results were functionally good, the majority perfect, although anatomically three of the results were bad.

Clavicle.—Treated by the three-handkerchief method. Results anatomically bad, functionally good.

Metatarsus.—All treated in walking plasters; results good.

Tarsus.—Tabulating these together in one average is perhaps misleading, as can be seen from the details below.

Two cases of fractured cuboid, each	8 weeks	Results good
Os calcis in child aged 9... ..	9 "	
Posterior tuberosity of astragalus	10 "	
Two cases of os calcis in adults, each	35 "	Still a little pain
(All the above with no displacement)		
A navicular slightly crushed	45 "	
One case with right and left os calcis fractured with displacement	46 "	

The last was admitted and displacement reduced, and later walked in two walking plasters. Anatomical result good, but still complained of some pain when discharged to light work.

External Malleolus.—I subdivide these fractures into those below, those through, and those just above the interosseous ligament. There were six infraligamentous, average time 5.6 weeks; six interligamentous, average time 9 weeks; one supraligamentous, average time six weeks. All were treated in walking plasters; results perfect.

Pott's Fracture.—I only use this term for a fracture-dislocation of the ankle. Two of the cases had no displacement when x-rayed, but must have had at the time of fracture, as, for example, "fracture of both malleoli and posterior articular surface of tibia." All but one in this series were treated as out-patients, so they do not represent the worst type of case with a lot of displacement and effusion. Results: all but one—namely, a posterior articular surface of tibia—were 100 per cent. anatomically; the functional result of the latter and one other were not perfect; the others were.

Tibia and Fibula.—Except for two these were all out-patient cases, so they represent the milder type of fracture in adults and those in children. The results anatomically were 100 per cent. in all but one, and functionally in all but two.

One of the latter was in a lady of 72 with an old-standing pes cavus. She said, however, that she could walk as well after as before the fracture. The other was in a boy aged 4½ with a fracture of the middle of the tibia. He was put in a walking plaster, but came up a few days later with swelling of the toes. He was admitted, with instructions that the plaster should be cut up its whole length if there was no immediate improvement. Unfortunately the plaster was only partly cut away round the foot, and some sloughing resulted. Subsequently healing was good, but the foot and toes are still stiff.

Fractures about Knee-joint.—The majority of these were simple cracks without displacement—two in the patella, five in the head of the tibia. They were all fit, with full or nearly full function in six to sixteen weeks. Two were in-patient cases; one, an external condyle of tibia, was fixed by a screw by open operation. Anatomical result perfect, functionally only 50 degrees of flexion; the other, a separated lower femoral epiphysis, is not a good result, as it has resulted in an increased genu valgum.

Lumbar Vertebra.—This was the crush fracture of the body of the vertebra treated in the ordinary hyper-extension plaster. It is perhaps worth mentioning that the patient returned to work—namely, gardening—in his plaster after two months.