THE TREATMENT OF FRACTURE-SEPARATION OF THE CAPITULAR EPIPHYSIS

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It has long been recognised that displaced fractures of the capitular epiphysis in children are prone to non-union and late deformity unless accurate reduction is obtained. Good results have been reported from conservative treatment (Kini 1942, McLearn and Merson 1954), but it is generally accepted that to obtain the best results open reduction is necessary. Some form of internal fixation is also advisable to prevent the pull of the common extensor muscles redisplacing the fragment. Internal fixation may be by suture of the extensor origin to the periosteum of the proximal fragment (Badger 1954, Watson-Jones 1955), or by fixation with screws or wire (Jeffery 1955, 1957, 1958; Wilson 1955).

The present review was undertaken to determine if there was, in fact, any difference in the result obtained by the use of either soft-tissue suture or metallic fixation.

MATERIAL

Seventeen children with capitular fracture-displacement treated by operation were examined personally between six months and seven years after the injury, the average length of follow-up being two and a half years. The method of internal fixation used is given in Table I. It was usual to use one or two sutures of chromic catgut when this method was chosen.

TABLE I
DETAILS OF SEVENTEEN CHILDREN WITH DISPLACEMENT
OF THE CAPITULAR EPIPHYSIS

Side injured*	13 left	4 right
Sex . . .	16 boys	1 girl
Age range . .	3-9 years	Average 5.6 years
Type of fixation	Catgut suture . . .	11
	Kirschner wire . . .	5
	Steel pin . . .	1

* Fourteen children were right handed.

It is interesting that the injury was predominantly left sided although most of the patients were right handed, which suggests that the fall on to the left hand occurred while the right hand was holding something, but the actual mechanism could not be elucidated from the case histories.

RESULTS

The results were uniformly good except in Case 1 in which non-union followed failure to reduce the fracture adequately at operation (Table II, Figs. 1 and 2).

In the remaining patients the elbow was either normal on clinical examination or showed only the slightest restriction of movement. Cases 6 and 15 had some varus deformity and Case 7 had a slight valgus deformity but in no child was the deformity unsightly or disabling.

TABLE II

DETAILS OF THE TREATMENT AND RESULT OF SEVENTEEN CHILDREN WITH FRACTURE-SEPARATION OF THE CAPITULUM

Case number	Sex	Age (years)	Side	Length of follow-up (months)	Symptoms	Deformity	Radiographs	Comment
Cases treated by suture								
1	Boy	4	Left	24	None	Slight	Non-union	A stable joint with loss of 5 degrees of flexion and extension. See Figures 1 and 2
2	Boy	4	Right	22	None	None	Union	See Figures 3 and 4
3	Boy	6	Left	22	None	None	Union	—
4	Boy	6	Left	21	None	Very slight	Union	Very slight loss of extension
5	Girl	6	Left	36	None	None	Union	—
6	Boy	6	Left	32	None	Slight	Union	5 degrees loss of flexion and very slight varus
7	Boy	9	Left	32	None	Very slight	Union	Very slight increase in valgus
8	Boy	8	Right	8	None	None	Union	—
9	Boy	3	Left	84	None	Slight	Union	Very slight loss of supination
10	Boy	6	Left	72	None	Slight	Union	Very slight loss of extension
11	Boy	5	Left	14	None	None	Union	—
Cases treated by wires or pin								
12	Boy	3	Right	8	None	None	Union	Treated with a stainless steel domestic pin
13	Boy	3	Left	6	None	Slight	Union	5 degrees loss of extension. Wire extruded at three weeks after operation
14	Boy	5	Left	37	None	None	Union	The Kirschner wire had to be removed later
15	Boy	5	Left	38	None	Yes	Union	10 degrees varus, that is, 20 degrees difference between left and right elbows
16	Boy	6	Left	29	None	None	Union	The Kirschner wire had to be removed later
17	Boy	5	Right	51	None	Slight	Union. Epiphysal irregularity	The two Kirschner wires used had to be removed later

The radiological results, with the exception of Case 1, were uniformly good. A typical example is shown in Figures 3 and 4.

When wire was used it was removed from four out of five elbows because extrusion started. In the other patient it extruded spontaneously at about the third week (Case 13). The pin used in Case 12 was still in place eight months after operation.

FIG. 1

Case 1—Displaced left capitulum in a boy of four years.

FIG. 2

Case 1—Non-union of the fragment, because of inadequate reduction, two years later.

DISCUSSION

One operation failed (Case 1) because the displacement was not reduced at operation and this was avoidable. In the other ten patients treated by suture the results were good and compare favourably with wire or pin fixation. Jeffery (1958) pointed out that bad results

with non-union occurred in those patients with undisplaced fractures which were either untreated or treated inadequately. He also said that bad results might follow attempts at manipulation or fixation by suture but the latter is not supported by this report.

FIG. 3

Case 2—Displaced right capitulum in a boy of four years.

FIG. 4

Case 2—The position twenty-two months after suture.

Good results can be obtained in the treatment of this injury by any of the accepted methods at present in use but fixation of the fragment by suture deserves wider popularity because it gives good results, is technically simple and is devoid of the complications of wire fixation.

SUMMARY

1. Seventeen children with fracture-separations of the capitular epiphysis are reviewed.
2. Soft-tissue suture was used in eleven and metallic fixation in six children.
3. There was one bad result because of faulty technique but all the other children obtained good results.
4. Soft-tissue suture was found to be a simple procedure with none of the complications of wire fixation.

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