PRESENTATION OF SUPRACONDYLAR FRACTURES OF THE HUMERUS IN SINGAPORE CHILDREN

W C G Peh
S R E Sayampanathan
N Balachandran

Department of Orthopaedic Surgery
Singapore General Hospital
Outram Road
Singapore 0316

Wilfred C G Peh MBBS

S R E Sayampanathan MBBS

N Balachandran MChOrth, MBBS, FRCSE
Senior Orthopaedic Surgeon and Head

SYNOPSIS

This prospective study is of 37 children with supracondylar fracture of the humerus. The fracture is commoner in males. The mean age of incidence of the fracture in males is higher than in females. The left arm is more commonly affected. All the fractures are results of falls. Almost half the patients (43.2%) visited traditional bone setters prior to hospital treatment. More than a quarter (27%) of the patients defaulted treatment within 2 months of initial injury.

INTRODUCTION

Supracondylar fracture of the humerus is one of the commonest elbow injuries in children. It constitutes about 20% of all fractures in Singapore children (1). It is estimated that about 200 supracondylar fractures occur in Singapore every year (2).

Whereas previous studies have concentrated on the management of such fractures and their complications, this study emphasises some interesting epidemiological patterns. The study also looks into the role played by traditional healers.

MATERIALS AND METHOD

A total of 40 patients with supracondylar fractures were seen between 1 Jul 1982 and 31 Dec 1982 at the casualty room (based at the Accident and Emergency Unit) of the Department of Orthopaedic Surgery, Singapore General Hospital. All these patients were below the age of 13 years. Of these, records of 37 patient were complete and the study is based on these 37 cases.

The fractures were classified into 3 types (3):

Grade 1: Fracture without displacement.
Grade 2: Fracture with displacement in one or more directions but with partial contact between the remaining fragments.
Grade 3: Fracture with complete displacement with loss of contact between fragments.

RESULTS AND DISCUSSION

Age and Sex Distribution

The distribution by age and sex of 24 male and 13 female patients is as follows: (Table 1).

TABLE 1
DISTRIBUTION OF FRACTURES BY AGE AND SEX

Age in years	1	2	3	4	5	6	7	8	9	10	11	12	Total
boys	1	1	1	1	5	2	2	4	5	1	0	1	24
girls	1	1	3	3	1	0	1	1	1	0	1	0	13
Total	2	2	4	4	6	2	3	5	6	1	1	1	37

The preponderance of this fracture in boys is well known. Our series shows that 64.8% of the patients were males. This is probably due to the fact that boys are livelier and their games are rougher (Table 2).

TABLE 2
DISTRIBUTION OF SUPRACONDYLAR FRACTURES BY SEX: COMPARISON WITH OTHER SERIES (4 — 8)

Author(s) and year	Present	Ali (1981)	Wong (1966)	Mitchell et al (1961)	Hoyer (1952)	Holmberg (1945)
boys	64.8%	65.1%	71.3%	63.7%	62%	61.3%
girls	35.2%	34.9%	28.7%	36.3%	38%	38.7%

The mean age of incidence of these fractures was 6.55 years. This is similar to figures obtained by other sereis (2, 4, 8, 9). Table 3.

TABLE 3
MEAN AGE OF INCIDENCE OF SUPRACONDYLAR FRACTURES — COMPARISON WITH OTHER SERIES

Author(s) and year	Present	Ali (1981)	Lim (1970)	Laurence (1956)	Holmberg (1945)
Number of of cases	37	109	48	108	160
Mean age in years	6.55	6.97	7.35	6.5	6.63

On more detailed analysis, we found that the mean age for boys is very different from that of girls (Table 4).

TABLE 4
MEAN AGE OF INCIDENCE OF FRACTURES IN MALES AND FEMALES — COMPARISON WITH OTHER SERIES

Author(s) and year	Present	Lim (1970)	Mitchell and Adams (1961)
Boys: mean age (years)	7.17	7.50	6.63
Girls: mean age (years)	5.42	6.50	5.78

This point has not been brought up before in other series. We postulte that maximum bone fragility of the distal end of the humerus occurs at an earlier age in females than in males.

RACIAL DISTRIBUTION

In a 1981 Caribbean study, (8), there was an abnormally large proportion of Indians (from India) sustaining this fracture. The authors attributed the reason to bone weakness from dietary or genetic factors (8). In our study, there was no significant predisposition of Singapore Indians to the fracture. Perhaps our more cosmopolitan eating habits have contributed to com-

bating this bone weakness. In fact, the racial distribution of supracondylar fractures in our study conforms with that of the general population.

SIDE OF INJURY

The left arm is more prone to fracture. Past studies have also shown this trend (2, 4, 6) (Table 5). It has been suggested that this comes about because the left arm has weaker muscles and is possibly used in a less skilled way. The left arm is also more often used for motions of protection and guard.

ROLE OF TRADITIONAL HEALERS

16 (or 43.2%) of the patients in the study had their fractures manipulated by a traditional healer (bomoh/sinseh/relative) first. This is a significant proportion by itself, especially when one considers that there is probably an additional group of patients who are treated traditionally but are not seen at the hospital.

There is a definite correlation between the time lag before seeking hospital treatment and treatment by the traditional healer (Fig 2). About half of the patients came to hospital soon after sustaining the fracture — none of them saw a traditionasl healer. By contrast, most of those presenting late had already been treated traditionally.

TABLE 5
DISTRIBUTION OF FRACTURES BY SIDE AFFECTED — COMPARISON WITH OTHER SERIES

Author(s) and year	Present	Lim (1970)	Mitchell et al (1961)	Holmberg (1945)
Right	43.2%	41.5%	34.1%	38.7%
Left	56.8%	58.5%	65.9%	61.3%

CAUSE OF FRACTURES

All the fractures occured as a result of falls. Half of the fractures took place at home Fig 1.

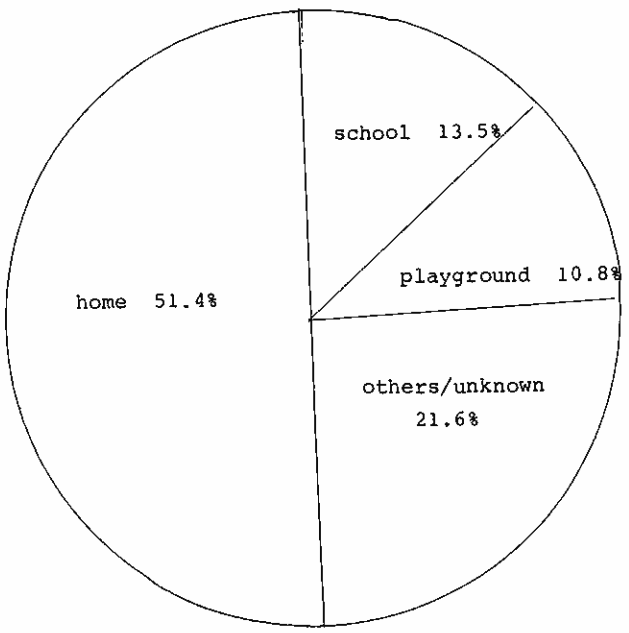
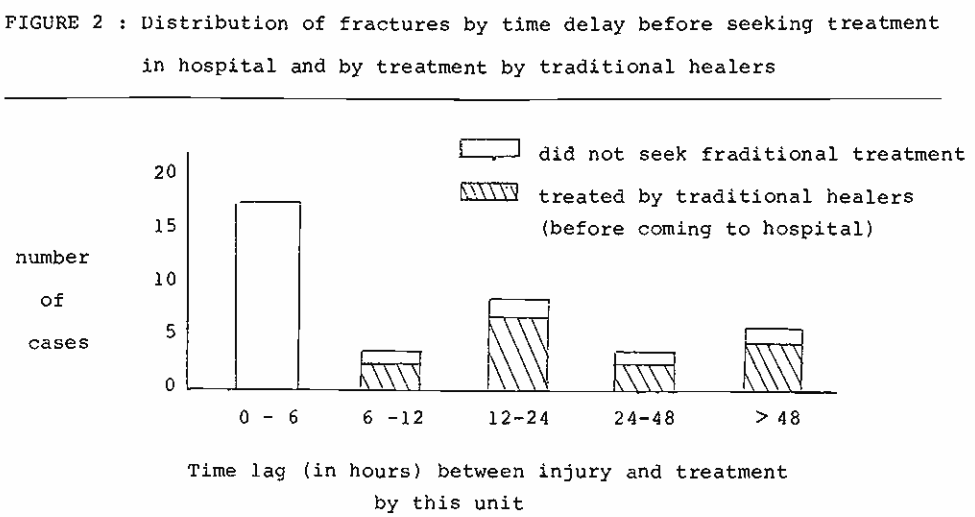


FIGURE 1: DISTRIBUTION of FRACTURES by PLACE OF INJURY.

Figure 1: Distribution of fractures by place of injury.

Figure 2: Distribution of fractures by time delay before seeking treatment in hospital and by treatment by traditional healers.



However, the traditional healers' manipulation did not contribute to the severity of the fracture or its complications (Table 6 and 7).

TABLE 6
DISTRIBUTION OF FRACTURES BY GRADE AND NUMBER SEEN BY TRADITIONAL HEALERS

Grade	No of cases	No seen by traditional healer
1	17	7
2	12	6
3	8	3
	37	16

TABLE 7
DISTRIBUTION OF COMPLICATIONS OF FRACTURES

	Total	Number seen by traditional healers
Satisfactory result	17	8
Restricted R O M	6	3
Deformity	2	1
Median Nerve Palsy	1	0
Absconded/too soon for assessment	11	4
Total	37	16

We believe that the relatively low incidence of serious complications is due mainly to the effective method of treatment used in our department for displaced fractures. This is the modified Dunlop's skin traction.

Defaultment rate is fairly high (27%). 2 patients absconded during hospitalisation to seek treatment from sinsehs, while the rest defaulted follow-up visits before full recovery (within 2 months of initial injury).

In modern day Singapore, it is indeed surprising to discover that such a significant proportion of patients turn to traditional healers before seeking treatment from western trained doctors. Especially so when one is dealing with a serious condition such as a fracture in children which is potentially deforming and has many complicaitons. The attitude is even more surprising when we note the fairly high defaultment rate even after confirmation of a fracture when the children are removed from the doctor's care.

This preliminary epidemiological survey should pave the way for further studies on supracondylar fractures of the humerus.

ACKNOWLEDGEMENTS

We would like to thank:- Medical Officers and House Officers of the Department, especially Drs Grace Tan and Agnes Tan, who have helped in the survey.

Mr K Q Yeo — for his advice.

REFERENCES

1. Wong P C N: An epidemiologic approach to the fractures of the children of Singapore. J Singapore Paed Soc 1965; 7:67-82.
2. Lim K L: A review of recent supracondylar fractures of the humerus in children. Singapore Med J 1970; 11:264-8.
3. Ger E: Supracondylar fractures of the humerus in children. Reasons for unsatisfactory results. S Afr Med J 1974; 48:1709-11.
4. Hofmberg L: Fractures in the distal end of the humerus in children. Acta Chir Scand 1945; 92:Supple 103.
5. Hoyer A: Treatment of supracondylar fractures of the humerus by skeletal traction in an abduction splint. J Bone Joint Surg 1952; 34A:623-37.
6. Mitchell W J, Adams J P: Supracondylar fractures of the humerus in children — a 10 year review. JAMA 1961; 1975:573-7.
7. Wong P C N: Epidemiology of fractures in Chinese children of Singapore. Med J Malaya 1966; 20:288-99.
8. Ali E: Supracondylar fractures of the humerus in Guyana. West Indian Med J 1981; 30:34-8.
9. Laurence W: Supracondylar fractures of the humerus in children — a review of 100 cases. Brit J Surg 1956; 44:143-7.