THE PULLED ELBOW

BY

B. W. BROADHURST, M.A., M.B., B.Chir.

AND

A. J. BUHR, B.A., M.D.

From the Accident Service, United Oxford Hospitals

Pulled elbow is a common injury which appears to be infrequently recognized. It can and should be diagnosed and treated by general practitioners. A review of the literature has revealed numerous accounts of this condition under a considerable variety of names, mostly descriptive. The most significant perhaps is "painful paralysis of young children." Green and Gay (1954) describe cases referred after lengthy periods of observation as brachial plexus lesions. It is interesting that the plea in all published work on the subject has been for wider recognition of the condition because (a) this accident "is probably one of the commonest lesions of the upper extremity in early life" (Hutchinson, 1885); (b) these patients "frequently fall into the hands of the bone setters and help form the rock on which their reputation stands" (Lindeman, 1885). It would appear that this recognition has never been accorded in the textbooks.

Diagnosis

The diagnosis is easily made, attention to the following points making mistakes unlikely.

1. *There is a Definite Age Group.*—The condition is confined to children under the age of 8 years. Van Arsdale (1889) found the average age of 100 patients to be 2.6 years. Our figures approximate reasonably to this.

2. *The History is Typical.*—A story of a sharp pull on the extended arm is essential to diagnosis. Typically the pull is to raise the child from the ground or withdraw it from danger ("temper tantrum elbow," "curbstone fracture").

3. *The Physical Signs are Typical.*—The arm is held limply at the side or supported on the lap with elbow slightly flexed (see Fig.). The forearm is pronated. With encouragement active full flexion, extension, and pronation are possible. Supination is not permitted, and, if attempted, causes pain which is poorly localized.

X-ray pictures are said to be normal in all cases, but a report on one of the elbows in our series described a subluxation of the radial head.

4. *Manipulation Cures the Condition Immediately.*—The affected arm is taken by the elbow and the wrist held in the other hand. Full supination is achieved by passive rotation with the forearm flexed to a right angle.

A case of pulled elbow.

Reduction is associated with a palpable or audible "click" and with immediate relief of symptoms. We believe this "click" is a diagnostic sign of the condition and is as typical as that of McMurray's test on a patient with a torn meniscus. Some degree of discomfort may be expected after successful manipulation if there has been a considerable interval between the time of injury and reduction. If discomfort persists a sling may be used for a few days. If symptoms recur, remanipulation and immobilization in a plaster-of-Paris splint for a week has been found to be adequate treatment.

Many theories have been advanced in attempts to explain the aetiology of the pulled elbow. Grant (1944) states that "before the age of 7 the head of the radius is hardly larger than the neck, so that sudden traction . . . may result in partial dislocation of the radius downwards." Stone (1916) carried out experiments on 12 arms from anatomic specimens; in six of these he demonstrated that in the hyperextended arm the annular ligament always slipped over the head of the radius into the space between the head of the radius and the capitellum when the head was pronated. This is the most commonly supported theory.

Our experience of the syndrome over the first six months of 1958 is briefly reviewed. During this time, 139 children under the age of 8 years were seen in the accident service for treatment of injuries of the upper limb, excluding lacerations and burns. These injuries were distributed as follows:

Fractures of the forearm bones (both or single) ..	53 (38.1%)
Sprains and other ligamentous injuries ..	29 (20.9%)
The pulled elbow ..	22 (15.8%)
Fractures of the humerus (any level) ..	20 (14.4%)
Fractures of the clavicle ..	15 (10.8%)

These figures show that even with different fractures grouped together under the heading of a single bone the pulled elbow is more common than fractures of the humerus or clavicle. If these groups are further broken down into specific fractures, it can be shown that the pulled elbow is, in fact, the most common single injury in the age group.

The average age of these patients with pulled elbow was 3.4 years. The youngest was 8 months and the oldest 7 years. Eight (36%) of the lesions were in males and 14 (64%) were in females. The left elbow was involved in 16 (73%) of the patients and the right elbow in 6 (27%) of the patients. In two instances subluxation recurred within 24 hours and symptoms were again relieved by manipulation. Reduction was maintained by plaster-of-Paris splintage for one week. In the remainder no restraint was found necessary.

Illustrative Case

A child aged 2 had a history of being pulled from the back seat to the front seat of a car. The usual physical signs were elicited. Manipulation was successful, and no restraint was imposed in view of the short history. Two days later, while putting the arm into the sleeve of a dress, the condition recurred and was manipulated by the father, again successfully. At a visit seven days later function of the arm was normal. The patient's mother volunteered that she herself had had similar recurrent episodes before the age of 5; these had been treated by the family doctor, who made her put her hand on top of her head, thus achieving full supination. The arm has been normal since.

Comment

In the light of our experience over the first six months of 1958 it is considered that the pulled elbow is a very

common condition. The significance of a pull on the extended arm in a young child is apparently infrequently recognized and these lesions are therefore diagnosed as "sprains." At some stage these subluxations presumably reduce spontaneously. In the meantime the children are miserable. The diagnosis is easy and can be made on the telephone; by a very simple manoeuvre immediate relief can be obtained.

Summary

Twenty-two patients with "pulled elbow" were seen in the accident service during the first six months of 1958.

It is thought that the condition has not received adequate recognition in this country.

The essential diagnostic features are: (a) a history of a pull on the extended arm of a young child, (b) limitation of supination, (c) a palpable click on reduction, and (d) immediate complete relief of symptoms following successful manipulation.

Reduction is achieved without a general anaesthetic by applying gentle thumb pressure over the head of the radius and fully supinating the partially flexed forearm.

It is emphasized that this is a condition which can be readily diagnosed and treated by the family doctor.

REFERENCES

- Grant, J. C. B. (1944). *A Method of Anatomy*, 3rd ed., p. 180. Williams and Wilkins, Baltimore.
Green, J. T., and Gay, F. H. (1954). *J. Bone Jt Surg.*, **36A**, 655.
Hutchinson, J. (1885). *Ann. Surg.*, **2**, 91.
Lindeman, S. H. (1885). *Brit. med. J.*, **2**, 1058.
Stone, C. A. (1916). *J. Amer. med. Ass.*, **67**, 28.
Van Arsdale, W. W. (1889). *Ann. Surg.*, **9**, 401.

Medical Memoranda

Hypertelorism Associated with Poor Frontal Development of Skull and Bilateral Sprengel's Shoulders

Hypertelorism, now a well-recognized clinical entity, was first described by Greig (1924), and has since been mentioned in association with a variety of clinical conditions; but, as Kerwood *et al.* (1954) point out, unless accurate measurements of interpupillary distance and head breadth are made, an erroneous impression of hypertelorism may be gained owing to flattening of the bridge of the nose. If the abnormality is pronounced it is usually associated with dementia.

Two cases of hypertelorism have been associated with Sprengel's shoulders (Slo-Bodkin, 1936; Reilly, 1931). It is thought worth while describing the following case as it appears to be the first one recorded in Europe, and to draw attention to Greig's original comments on the mechanism whereby the condition originates.

CASE REPORT

The patient, a girl born in 1923, was the second child of normal parents, the elder sibling being a boy with no evidence of hypertelorism. According to the mother her pregnancy and delivery were uncomplicated, but as soon as the child was born the increased distance between the eyes was evident. No photographs of the child in her first

weeks of life were available, but at 18 months and 3 years of age gross hypertelorism was obviously present.

She had the typical appearance of hypertelorism, the interpupillary distance being 8 cm., and the breadth of the skull 14.2 cm., the ratio of these two being 0.56, the upper limit of hypertelorism found by Kerwood *et al.* On palpation of the skull, two bone defects were present in the parietal region in the situation of parietal foramina, the occiput was flattened, and there was a slight ridge in the region of the coronal suture. The palate was extremely high, cleft in the posterior third (Fig. 1), and the front incisors were projected. There was a small port-wine naevus (1 by 3 in.—2.5 by 7.5 cm.) over the left eyelid and extending on the forehead. Bilateral Sprengel's shoulders were present, with a gross thoracic kyphoscoliosis and compensating scoliosis in the cervical region.

The left knee was disorganized and had been operated upon, and there was a slight valgus deformity to both ankles. Apart from this the extremities were normal; although muscles were hypotonic, stretch reflexes could be obtained. Breast development was very poor, axillary and pubic hair scant, but she menstruated regularly.

Mentally she was an idiot, unable to speak, although she showed signs of pleasure, excitement, and fear. She walked fairly well, fed herself, and was clean if she was taken at frequent intervals to the toilet. Her behaviour was that of a pleasant docile patient.

X-ray examination showed very poor development of the frontal region together with abnormalities in the occipital region (Fig. 2). Thickening of the metopic suture was seen.

FIG. 1

FIG. 2