

Pulled Elbow Syndrome in Infants below 2 Years of Age: A Rare Entity

İki Yaşın Altındaki Bebeklerde Görülen Bakıcı Dirseği Sendromu: Nadir Bir Antite

Mohd Ikraam Ibrahim¹, Mazuin Mohd Razalli², Ferdhany Muhamad Effendi¹, Rudy Reza Johan¹

¹ Department of Orthopaedics and Traumatology, Faculty of Medicine, Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor, Malaysia

² Department of Radiology, Faculty of Medicine, Universiti Teknologi MARA (UiTM), Sungai Buloh, Selangor, Malaysia

ABSTRACT

Pulled elbow in children below 2 years of age is relatively uncommon. We illustrate 2 cases presenting the characteristic features of pulled elbow but was misdiagnosed as soft tissue injury. Diagnosis was established 12 hours later for the first case and 48 hours later for the second case after referral to the orthopaedic paediatric unit. The authors emphasized the importance of recognizing this syndrome and vigilantly treating it with closed manipulative reduction.

Key Words: Nursemaid's elbow, pulled, infants, subluxed radial head

Received: 07.05.2016

Accepted: 12.21.2016

ÖZET

İki yaşın altındaki çocuklarda bakıcı dirseği görülmesi nispeten nadirdir. Bu olgu sunumunda, yumuşak doku hasarı olarak yanlış tanı konan iki bakıcı dirseği olgusunu sunduk. Tanılar, olgular Ortopedi Pediatri Ünitesine gönderildikten sonra ilk vaka için 12 saat sonra ve ikinci vaka için ise 48 saat sonra konuldu. Yazarlar, bu sendroma tanı koymanın ve kapalı manipülatif reduksiyon ile dikkatle tedavi etmenin önemini vurgulamışlardır.

Anahtar Sözcükler: Bakıcı dirseği, çıkık, bebek, radius başı çıkığı

Geliş Tarihi: 05.07.2016

Kabul Tarihi: 21.12.2016

INTRODUCTION

Pulled elbow syndrome or nursemaid's elbow is a terminology to describe radial head subluxation or annular ligament slippage which is common among children below 5 years of age, with a mean age between 2-3 years old. It rarely occurs after 7 years of age. The incidence predominate in girls with a range of 60-65%. The injury somehow has a higher predilection towards the left elbow approximating 70% (1).

CASE REPORT

Case 1

A 6 months old fretful baby girl was brought to the Accident & Emergency unit at night by her mother for an acute onset of reduced left upper limb motion after being babysit in the nursery. There was no witness to any form of trauma like fall or ill-treatment.

Address for Correspondence / Yazışma Adresi: Dr Mohd Ikraam Ibrahim, Department of Orthopaedics and Traumatology, Faculty of Medicine, Universiti Teknologi MARA, 47000 Sungai Buloh, Selangor, Malaysia E-mail: instink81@yahoo.com

©Telif Hakkı 2017 Gazi Üniversitesi Tıp Fakültesi - Makale metnine <http://medicaljournal.gazi.edu.tr/> web adresinden ulaşılabilir.

©Copyright 2017 by Gazi University Medical Faculty - Available on-line at web site <http://medicaljournal.gazi.edu.tr/>

doi:<http://dx.doi.org/10.12996/gmj.2017.38>

Clinical examination revealed a pronated left upper limb with no spontaneous movement. There was no swelling, bruising, erythema or ulceration of the skin. Point tenderness was difficult to elicit. Circulatory status was intact. Radiograph of the left upper limb was normal (Fig. 1). A diagnosis of soft tissue injury was made and she was admitted to the paediatric orthopaedic ward for observation.



Figure 1. Radiograph of the left upper limb with no obvious fracture or dislocation

During the morning ward rounds with the senior consultant paediatric surgeon, a spot clinical diagnosis of pulled elbow was made. Urgent close reduction was performed with the child lying supine on the bed. The hyperpronation technique was used with the elbow in extension. As no sedation was required assurance was explained to the mother that the child may cry in a jiffy during the prompt procedure. Two hours later the infant was comfortably moving her left upper limb in full range of motion.

Case 2

A distress 14-month-old female toddler was brought to the Accident & Emergency unit for an acute onset of reduced left upper limb motion noted by her mother when she was picked up from the nursery. The child was fidgety during examination especially when the left shoulder was palpated. There was no evidence of ecchymosis, swelling or ulceration of the whole left extremity. There was no fracture dislocation detected by the radiograph (Fig. 2).

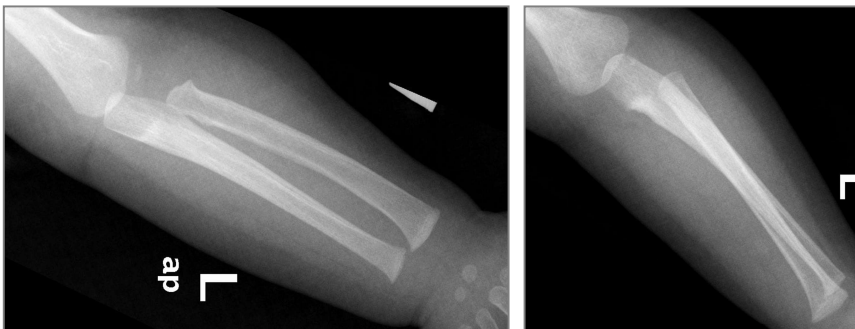


Figure 2. Anteroposterior and lateral radiograph of the left elbow and forearm showing no abnormality.

She was diagnosed as soft tissue injury of the left shoulder and was given syrup paracetamol for analgesia. She was discharged home with subsequent follow up of 2 days to the paediatric orthopaedic clinic.

When reviewed by the senior paediatric orthopaedic consultant on the day of appointment, the pronated orientation of the left upper limb with no movement actuated the diagnosis of pulled elbow (Fig. 3).



Figure 3. Clinical picture showing the child's left upper limb in pronated position.

An urgent closed reduction via the hyperpronation manoeuvre with the elbow in extension without sedation was performed with the child sitting on the mother's lap. Within 5 minutes the child was moving the left upper limb in full range of motion (Fig. 4).



Figure 4. Clinical picture showing the child's left elbow able to flex again.

DISCUSSION

The usual mechanism of injury is longitudinal traction on the extended elbow with the forearm pronated, which occurs typically when the child is lifted or swung at the wrist or hand. There are few pathoanatomical features in the paediatric elbow which contribute to this syndrome. During traumatic pronation, the lateral edge of the radial head which is narrow with round margin precipitates slippage of the annular ligament. At this position, once the annular ligament had partially slipped over the radial head, spontaneous reduction is deemed difficult (2).

The distal attachments of the subannular membrane and annular ligament to the neck of the radius are normally weaker in toddlers. Their smaller radial head diameter may also contribute to the slippage. The annular ligament will eventually strengthen sufficiently by 5 years of age (1).

It was also postulated that the slippage occurs because the proximal radial epiphysis is more malleable due to reduced ossification (3). Hyperlaxity also causes annular ligament slippage (4). Radiograph is difficult to detect deranged radiocapitellar lines as the ossification centre of the proximal radial epiphysis has not ossified. However it is a useful tool to exclude any concomitant fractures around the elbow prior to any form of manipulative reduction.

With the advent of ultrasonography, the pathologic lesion of pulled elbow at the annular ligament can be better delineated. Pulled elbow can be classified into 2 types, type I pulled elbow is when there is interposed annular ligament and type II is when the annular ligament is torn; both with subluxed radial head (5).

A difference of 3mm in the capitello-radial distance when comparing the contralateral side is suggestive of radial head subluxation (6).

Management of pulled elbow is non-operative via closed reduction. Two types of maneuver have been proposed. The first technique is via supination with either flexion or extension of the elbow (7). The second technique is via hyperpronation with the elbow extended. This technique is virtually more superior as it requires fewer attempts and is more successful when supination fails (8). After successful reduction immobilization of the elbow is not necessary. Parents should be advised to avoid longitudinal pulling on the upper extremity.

CONCLUSION

Pulled elbow commonly occur in toddler 2 to 3 years of age; the stage known as the "terrible twos" where their desire to be independent is exponentially growing. Their developmental motor milestone involves running, jumping and balancing. Hence they may have been abruptly pulled back by their hand as to prevent them from falling down (9).

The care taker who are commonly right hand dominant may spontaneously grab the child on their left extremity. Females are affected more probably because of the wider carrying angle of the elbow. However future study should be conducted to confirm these hypotheses.

The incidence of pulled elbow in children below 2 years of age is relatively uncommon. Nevertheless one should be vigilant to recognize this syndrome as it is a clinical diagnosis of exclusion. The brief close reduction will not only treat the syndrome but also simultaneously assert the diagnosis. The pragmatic mode of reduction can be based on one's familiarity and preference.

Ultrasonography may be an impractical adjunct to facilitate in the diagnosis in the clinical setting as it is time consuming and requires specialized expertise. Type II pulled elbow is treated as type I because children acquire excellent healing and remodeling properties.

Conflict of interest

No conflict of interest was declared by the authors.

REFERENCES

1. Salter RB, Zaltz C. Anatomic investigations of the mechanism of injury and pathologic anatomy of pulled elbow in young children. *Clin Orthop* 1971; 77:134-43.
2. Matles A, Eliopoulos K. Internal derangement of the elbow in children. *Int Surg* 1967; 48:259-63.
3. Griffin ME. Subluxation of the head of the radius in children. *Pediatrics* 1955; 15:103-6.
4. Amir D, Frankl U, Poggrund H. Pulled elbow and hypermobility of joints. *Clin Orthop* 1990; 257:94-9.
5. Diab HS, Hamed MMS, Allam Y. Obscure pathology of pulled elbow: dynamic high-resolution ultrasound-assisted classification. *J Child Orthop* 2010; 4:539-43.
6. Kosuwon W, Mahaisavariya B, Saengnipanthkul S, Laupattarakasem W, Jirawipoolwon P. Ultrasonography of pulled elbow. *J Bone Joint Surg Br* 1993; 75:421-2.
7. Quan L, Marcuse EK. The epidemiology and treatment of radial head subluxation. *Am J Dis Child* 1985; 139:1194-7.
8. Macias CG, Bothner J, Wiebe R. A comparison of supination/flexion to hyperpronation in the reduction of radial head subluxations. *Pediatrics* 1998; 102:10.
9. Choung W, Heinrich SD. Acute annular ligament interposition into the radiocapitellar joint in children (nursemaid's elbow). *J Pediatr Orthop* 1995; 15:454-6.