

Missed cases of ‘pulled elbow’– A retrospective study of 28 cases managed at a tertiary care centre in Uttarakhand

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Abstract

Introduction: The ‘pulled elbow’ is fairly common injury seen at primary care level. This injury has characteristic history, clinical presentation and imaging features. Many often the injury is missed and neglected for days and picked up later at further consultation. The missing of these injuries might be a result of gaps in our core knowledge and clinic-radiological assessment. **Method:** We hereby evaluate a data of 28 cases with missed pulled elbow injuries that were treated in our institute. Various aspects of first opinions and reason for delay are described for comprehensive knowledge of gaps in the treatment. **Result:** The strengthening of practical knowledge regarding this simple injury is recommended in order to diagnose and treat them in first place and avoid agony of child and parents. Lack of knowledge regarding proper assessment of elbow by clinical and radiological methods has been found to be a major cause for missed injuries. **Conclusion:** The knowledge of factors responsible for delayed or missed diagnosis at initial consultation is necessary for remedial measures for its appropriate management at primary level and decrease healthcare burden at tertiary level care.

Key words: Elbow, Subluxation, Radial Head, Pulled Elbow, Closed Reduction, Annular ligament

Introduction

Pulled elbow syndrome is a common elbow injury in

children and comprises of subluxation of radial annular ligament [1]. The real incidence and epidemiology is difficult to ascertain owing to the fact that many cases are managed at primary care level and some of the cases get spontaneously reduced. However detailed

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epidemiological and demographic data is available from various studies pertaining to the injury [2,3]. The injury occurs from two month of age to seven years with peak at 2-3 years and presentation after seven years of age is rare. Female sex and left side of elbow are more commonly affected [4].

The strengthening of attachments of annular ligament and subannular membrane by the age of five years relates to decrease incidence in older children and anatomic studies have validated slippage of annular ligament following a longitudinal traction over extended elbow [5].

The positive factors related to the injury are relative absence of concomitant injuries and favorable outcome following spontaneous or attempted closed reduction and rarity of reported negative sequelae. Early diagnosis and reduction therefore is necessary to relieve the discomfort and avoid irreducible, neglected and symptomatic cases.

Materials and Methods

A retrospective data of consecutive cases in an annual audit of outpatient cases was evaluated for pediatric elbow injuries with diagnosis of pulled elbow confirmed clinically or by radiological assessment from July 2013 to February 2015 in our tertiary care hospital. The inclusion criteria was any referred case of suspected pulled elbow for evaluation from immediate to late presentation.

The diagnosis was supported by a definite history of longitudinal pull of forearm, with or without radiographs of affected elbow, leading to painful restriction of elbow motion.

Radiological investigations were done in cases with no radiographs brought by patient and was aimed for documentation purpose. Important details of data collection included demographic data, the place of first consultation, the time since injury and the nature of treatment given along with first provisional diagnosis.

The cases were assessed clinically and diagnosis of pulled elbow was made after careful clinical exclusion of dislocation or fracture around elbow. Any associated ulna fracture as part of Monteggia fracture was also excluded.

The assessment of radiocapitellar line was made and used to support diagnosis of pulled elbow. The palpation of bony protuberances and medial and lateral column of humerus with no appreciated crepitus ruled out fracture of distal humerus and similar palpation of ulna ruled out its fracture.

The proximal radius is difficult to assess except at its head level which can be felt manually while the forearm is passively supinated and pronated. The presence of fracture has marked tenderness with or without palpable crepitus. All cases were isolated radial head subluxations.

Radiographs of affected elbow region in two planes and in certain cases of opposite side for comparison were advised for documentation purposes. The subluxation was then reduced with standard technique of supination of the forearm with elbow flexed with or without pressure over the radial head for a palpable snap of reduction. The assessment of child after a few minutes post-reduction for relief of pain and regain of elbow motion was considered as successful procedure. No

post-reduction radiograph was advised in satisfactory cases of reduction on clinical basis. A sling was given for a day or two for protection and pain relief and discontinued thereafter for active range of motion and activities of daily living. A follow up of 3,6 and 12 weeks was targeted initially and minimum of four months was ensured in each case. Recurrence or other complications were noted in the follow up apart from functional range of motion.

Results

A total of 30 cases were identified that met inclusion criteria as described and their data was analysed. Two cases were excluded later as one with congenital dislocation of bilateral radial head and the other had radial head dislocation as part of hereditary multiple exostoses. The rest 28 cases were part of the study. The most cases were in 2-3 year age bracket (24 cases, 85.71%) while two cases were more than 3 year old. This is in accordance with usual age of presentation described in other studies as well. The males dominated our studies as 16 cases (57.14%) and left side as the commoner side involved in 22 cases (78.57%). As the left side has been a commoner presentation, males in our studies have remarkable higher incidence and it might have social reason as male child is more likely to be consulted more and to better places.



Figure 1: Radiograph showing radial head subluxation as radiocapitellar line not bisecting the capitellum.



Figure 2: Another case with AP (a) and lateral (b) elbow radiograph depicting radial head subluxation in lateral view.



Figure 3: Post reduction radiograph showing correction to a normal pattern.

Diagram 1: The pie chart showing the pattern of first diagnosis made at initial consultation.

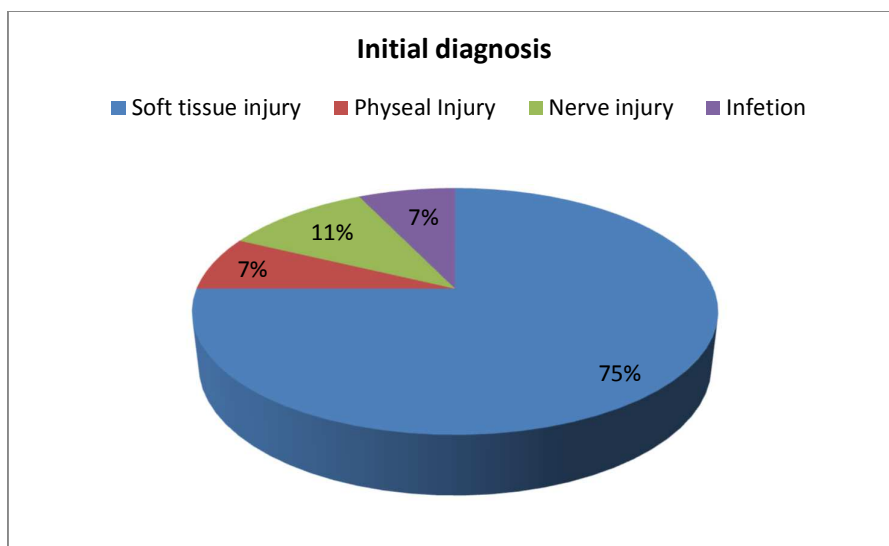
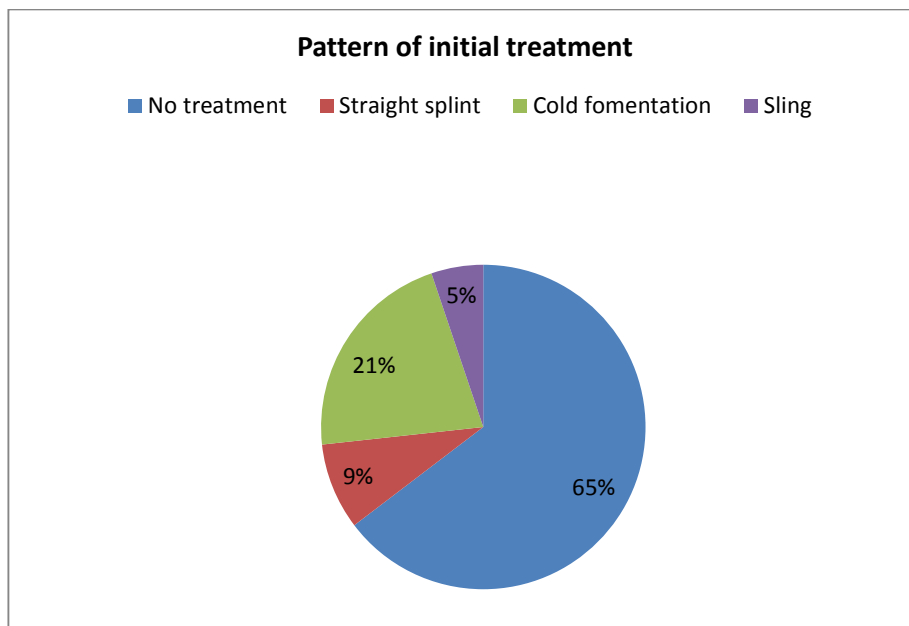


Diagram 2: The pie chart showing the pattern of initial treatment modality provided

Most of the cases were dealt with primary health centers (15=53.57%) followed by pediatricians (05=17.85), indigenous bone setters (03=10.71%), general practitioners (03=10.71%) and surprisingly orthopedic doctors (02=07.14%).

The various patterns of provisional diagnosis was given (Diagram 1) and the list includes soft tissue injury as most common first diagnosis in 21(75%) cases, probable physel injury and probable infection in 2 cases each (07.14%) and nerve injury in 3 cases (10.71%).

All the cases were managed successfully with closed reduction technique except one case which reduced spontaneously. No recurrence of deformity was seen in follow of at least four months (range 4 months to 18 months).

Discussion

The pulled elbow syndrome has been specifically linked to classic history of longitudinal traction injury to pediatric elbow.

Many studies have reported failure of getting classical history in sizeable number of cases. 33 to 49% cases were linked to no clear history about mechanism of injury in certain literature [6,7].

Apart from proper history –clinical correlation, poor assessment of radiographs is another major cause to miss the pulled elbow. As there are no fractures involved, the radiograph is mostly considered and

labeled as normal if subtle deviation from normal anatomy is not examined in detail. Increased patient

load and lesser time devoted to clinic-radiological assessment is another factor in this regard.

One very important factor might be inappropriate knowledge of normal landmarks and subtle features of radiological assessment to primary care providers, most of them might not be trained in this context. Clinical diagnosis has been supported in less than 5 years of cases with definite classic history and radiography advocated in cases with atypical presentations or where underlying fracture is suspected [1,5,8,9].

The concept of 'radiocapitellar line' a line drawn along the axis of proximal radial shaft bisects the centre of ossification of capitellum in a normal elbow in every position, is critical and easy method to delineate subtle deviation from normal anatomy.

A radiocapitellar line off the centre of capitellum is commonly found in pulled elbow cases [10,11].

There is however a possibility of self reduction of the subluxation during positioning for elbow radiographs. Ultrasonography has been another option [12] for the diagnosis but in good hands and our centre has limited human resources for musculoskeletal ultrasonography.

The closed reduction was done by passive supination of the forearm as described method in previous studies [1,3,6,8,13]. The procedure used by us was found to be easy and effective method of reduction.

Recently hyperpronation methods of reduction have been studied as an equally good alternative method of reduction [14,15].

The workers believe this method of reduction useful in cases of failed attempt of supination method. We used a short period of protective sling and arm pouch. Studies recommend that it helps in healing and checks occurrence of second injury[5,16].

Almost all of these cases require no further intervention in reported literature and the need for surgery is limited. Only cases with painful irreducible subluxation may require surgical intervention [9,17].

We experienced no surgical requirement as each case had uneventful reduction and there was no recurrence or other complication in the follow up period.

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