

Review of Important Recent Articles in Pediatric Orthopaedics

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Background:

Paediatric orthopaedics as a super speciality has evolved in the last 3 decades to become a vast ocean of changing concepts and rethinking of treatment strategies and hence, is abundant in evidence based literature. In the last year over a 100 good articles and research papers have been published on various subjects. In this commentary, we have sifted out a few of the most relevant ones to the day to day clinical practice and some which are relevant to both the general orthopaedic surgeon and paediatric orthopaedic surgeon. The following is a compilation according to categories which we think will interest the reader. The summary has been enlisted here along with a short comment on the utility of the article. The reader is advised to go into the full text of any selected article if any particular article meets their requirements: as providing full text of each article is beyond the purview of this review, making it over lengthy.

Aim:

To analyse the important articles published in the field of Pediatric Orthopaedics in the recent past which would have a significant impact in the

understanding and management of various common Pediatric Orthopaedic disorders.

1) TRAUMA:

1. "Pediatric Supracondylar Fractures: Variation in Fracture Patterns and the Biomechanical Effects of Pin Configuration."

by Jaebon et al. (J Pediatr Orthop 2016;36:787-792) [1]

REMARKS –This is one of the very few studies providing an insight on the biomechanical stability of pin configurations in various patterns of supracondylar fractures, showing the all lateral pin construct to provide favourable outcomes in most of the fracture patterns with fewer complications.

2. "Treatment of flexion-type supracondylar fractures in children: the 'push-pull' method for closed reduction and percutaneous K-wire fixation."

by Chukwunyerena and his colleagues. (Journal of Pediatric Orthopaedics B 2016, 25:412-416)[2]

Remarks- This is a research paper describing a new, simplified technique in treating flexion-type supracondylar humerus fractures (by push-pull technique) in pediatric population with optimal clinical and radiological outcomes. This technique would help the general orthopaedic surgeon to treat this difficult injury with ease.

3. "Conservative Management of Minimally Displaced (<2mm) Fractures of the Lateral Humeral Condyle in Pediatric Patients: A Systematic Review".

A review article by Knapik et al. (J Pediatr Orthop 2017;37:e83-e87) [3]

Remarks - This paper provides a review of various published research papers regarding the management of minimally displaced lateral humeral condyle fractures, which is still a pandora's box to the orthopaedic surgeons. A conservative management can be attempted for minimally displaced fractures (<2mm) provided a close radiographic follow up is carried out.

4. "Closed Reduction and Percutaneous Pinning Versus Open Reduction and Internal Fixation for Type II Lateral Condyle Humerus Fractures in Children Displaced >2mm".

by Pennock et al. (J Pediatr Orthop 2016;36:780-786)[4]

Remarks– This research paper describes about the surgical management in displaced lateral humeral condyle fractures (> 2mm) but with minimal joint incongruity, reported similar results with closed reduction and percutaneous pinning as well as open reduction with internal fixation. Closed reduction can be preferred due to its less invasiveness and operative time, only if joint congruity is confirmed. It outlines objective criteria for the different lines of management however the clinician

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must not forget the significant learning curve in the judgement of the displacement.

5. “Does operative fixation affect outcomes of displaced medial epicondyle fractures?”

By Stephanovich et al. (J Child Orthop (2016) 10:413–419) [5]
Remarks—Although this study provides a small cohort, reports higher union rates, less complications and early return activity especially sports, with operative management for displaced medial humeral condyle fractures. It deserves merit for attempting to study a large cohort for a rare injury, most clinicians are still unclear on its diagnosis and management and hence we recommend it as a must read.

6. “Compartment syndrome in infants and toddlers”

Research paper published by Broom et al. (J Child Orthop (2016) 10:453–460) [6]
Remarks— This paper provides an insight on the incidence of compartment syndrome in children less than 3 yrs of age, as diagnosis is often delayed. It has been reported that, even with a delay in diagnosis (48-72 hrs after injury) the outcomes are favourable after fasciotomy especially in toddlers.

II) OSTEO-ARTICULAR INFECTIONS

1. “Kocher Criteria Revisited in the Era of MRI: How Often Does the Kocher Criteria Identify Underlying Osteomyelitis?”

A research paper published by Nguyen and his colleagues. (J Pediatr Orthop 2017;37:e114–e119) [7]
Remarks—This is one of the recent landmark papers in musculoskeletal infections showing the importance of the additional investigation of MRI in children with the diagnosis of septic

arthritis according to the Kocher's criteria, as there is a high chance of concomitant osteomyelitis.

2. “Laboratory predictors for risk of revision surgery in pediatric septic arthritis.”

Research work by Telleria et al. (J Child Orthop (2016) 10:247–254) [8]
Remarks—This research paper throws light on the predictors of revision surgery following index surgery for septic arthritis in children, and predicts a positive blood culture and a high CRP at initial presentation to be statistically significant risk factors.

3. “Tubercular dactylitis in children”

By Balaji and his colleagues. (Journal of Pediatric Orthopaedics B 2017, 26:261–265) [9]
Remarks— This research paper provide light on the delay in diagnosing TB dactylitis as there are various mimickers, and prompt multi-drug therapy as the treatment of choice.

4. “Hand and wrist tuberculosis in paediatric patients – our experience in 44 patients”

By Prakash et al. (Journal of Pediatric Orthopaedics B 2017, 26:250–260) [10]
Remarks— This research provides a large cohort of patients with tuberculosis of upper limb especially, wrist and hand. A prompt early diagnosis and management in the form of ATT is essential to get favourable outcomes and prevent morbidities in the form of residual stiffness and pain due to the development of arthritis.

III) HIP DISORDERS:

1. “Avascular necrosis following closed reduction for treatment of developmental dysplasia of the hip: a systematic review”

by Bradley and his colleagues. (J Child Orthop (2016) 10:627–632) [11]
Remarks - This is a review article on the

incidence of AVN following closed reduction for DDH, with a significantly large follow up, showing a significant amount of AVN (10%).

2. “Long-term outcome following medial open reduction in developmental dysplasia of the hip: a retrospective cohort study”

a study by Gardner and his colleagues. (J Child Orthop (2016) 10:179–184) [12]
Remarks— This study provides an evidence based review of medial open reduction in the treatment of dysplasia of hip, showing a significant amount of AVN and unsatisfactory outcome on long term follow up of these cases although initial short term results are satisfactory. This would probably explain why this operative approach is not so popular over the conventional Somerville anterior approach (bikini) which is accepted worldwide besides being a cosmetic approach

3. “MRI versus computed tomography as an imaging modality for post reduction assessment of irreducible hips in developmental dysplasia of the hip: an inter-observer and intra-observer reliability study”

A study conducted by Barkatali and his colleagues. (Journal of Pediatric Orthopaedics B 2016, 25:489–492) [13]
Remarks - This is one of the very few papers showing a definite comparison between the use of MRI and CT scan for the assessment of irreducible hips post reduction and provides a clear recommendation of using MRI over CT scan.

4. “The alpha angle as a predictor of contralateral slipped capital femoral epiphysis”

by Boyle and his colleagues. (J Child Orthop (2016) 10:201–207) [14]
Remarks— This is one of the recent studies throwing a highlight on

development of SCFE in the contralateral hip which could be prevented by measuring the alpha angle and assessing the risk during the index surgery with a statistically significant correlation. It is an excellent article which provides very useful guidelines to judge the angle of slip accurately.

5. “Delay in the Diagnosis of Stable Slipped Capital Femoral Epiphysis”. A study conducted by Iwinski and his colleagues. (J Pediatr Orthop 2017;37:e19–e22) [15]
REMARKS – This is one of the recent articles that provides a brief information the factors contributing to the delay in the diagnosis of stable SCFE. A significant delay has been reported when the patient is seen by a non-orthopedic provider and when the patient presents with knee pain instead of hip.

IV) CLUBFOOT:

1. “Ponseti method compared to previous treatment of clubfoot in Norway. A multicenter study of 205 children followed for 8–11 years”. A study conducted by Saetersdal K and his colleagues. (J Child Orthop (2016) 10:445–452) [16]
Remarks– This article throws a significant light on the Ponseti method with a good amount of follow up, showing the significance and merits of using Ponseti method in comparison to other casting methods. It also highlights the paradigm shift that has occurred with respect to approach to club foot treatment.

2. “Treatment of complex idiopathic clubfoot using the modified Ponseti method: up to 11 years follow-up”. A study conducted by Matar H E and his colleagues. (Journal of Pediatric Orthopaedics B 2017, 26:137–142) [17]
REMARKS – This is one of the few

long term studies on the use of modified Ponseti method for the management complex idiopathic clubfoot showing effective and reliable results, but with a small sample size as compared to the Indian sub- continent.

3. “Tarsal Bone Dysplasia in Clubfoot as Measured by Ultrasonography: Can it be Used as a Prognostic Indicator in Congenital Idiopathic Clubfoot? A Prospective Observational Study”. A study by Chandrakanth U and his colleagues. (J Pediatr Orthop 2016;36:725–729) [18]

Remarks– Excellent article. This is one of the new areas of research in the management of clubfoot, using the amount of tarsal bone dysplasia as a marker for prognostication in children with clubfoot. Although a short term study, has paved the way for this new area of research and analysis in the management of clubfoot.

V) FLAT FOOT:

“What’s New in Pediatric Flatfoot?”. This was a POSNA review article reported by Bauer K, Mosca V S and Zionts L E. (J Pediatr Orthop 2016;36:865–869) [19]
Remarks– This paper deserves a lot of merit for being an eye opener especially regards with non uniformity of clear definitions and management protocols. Here the authors have described about the proponents of managing various causes of pediatric flatfoot like flexible flat foot, Tarsal Coalition and CVT, and the latest concept regards to the management of the above conditions.

VI) CEREBRAL PALSY:

1. “Stepwise surgical approach to equino-cavovarus in patients with cerebral palsy”. This article was published by Won H S and his colleagues. (Journal of Paediatric

Orthopaedics B 2016, 25:112–118) [20]

Remarks – This article provides a brief and clear outline about the step wise management of common foot deformities encountered in Cerebral Palsy.

2. “A balanced approach for stable hips in children with cerebral palsy: a combination of moderate VDRO and pelvic osteotomy”, published by Reidy K et al. (J Child Orthop (2016) 10:281–288) [21]

Remarks – Providing a moderate but adequate amount of varus along with acetabular procedure, gives a favourable outcome especially in CP children with GMFCS IV and V.

VII) OBSTETRIC BRACHIAL PLEXUS PALSY

1. “Correction of elbow flexion contracture by means of olecranon resection and anterior arthrolysis in obstetrical brachial plexus palsy sequelae”. A study conducted by Senes and his colleagues. (Journal of Pediatric Orthopaedics B 2017, 26:14–20) [22]
Remarks- This is a pilot study which provides information on a new technique of olecranon tip resection with elbow arthrolysis in young patients with OBPP sequelae with reliable outcomes. However this is not a widely practised procedure we would advise the novice reader to interpret and adopt with caution as it is meeting with scepticism even in expert hands.

2. “Evaluation of functional outcomes and preliminary results in a case series of 15 children treated with arthroscopic release for internal rotation contracture of the shoulder joint after Erb's palsy”. A study conducted by Elzohairy and his colleagues. (J Child Orthop (2016) 10:665–672) [23]
Remarks– This article describes a new

minimally invasive technique for the management of internal rotation contracture in the children with OBPP at a younger age with favourable mid-term results.

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Conflict of Interest: NIL
Source of Support: NIL

How to Cite this Article

.Mehta R, Sarathy K. Review of Important Recent Articles in Paediatric Orthopaedics *Journal of Clinical Orthopaedics*. Jan - June 2017; 2(1):52-55