IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 11 Ser.3 (November. 2020), PP 17-23
www.iosrjournals.org

Evaluation of the Role of High Resolution High Frequency Ultrasonography in Painful Hip Pediatric Age Group

Dr. Chaitali Chattopadhyay, Md & Dr. Kedarnath Pal, Md

Date of Submission: 28-10-2020 Date of Acceptance: 09-11-2020

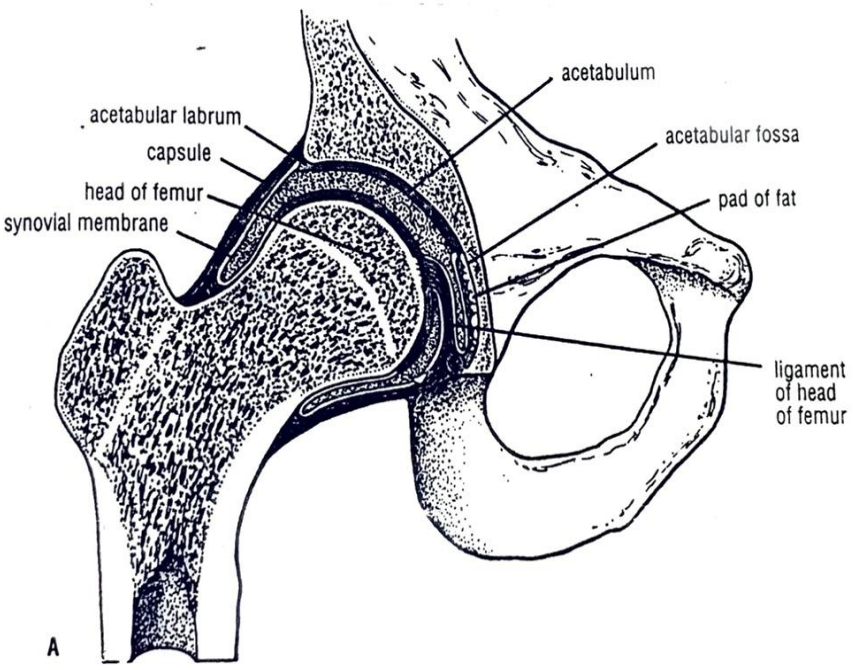
This study is centred around the role and usefulness of HRUSG in painful hip in pediatric age group.

Causes of hip pain :
1. Infective
2. Inflammatory
3. Vascular compromise
4. Traumatic
5. Tumors

Common cases of painful hip in pediatric age group :
1. Transient synovitis
2. Infective arthritis (septic and tubercular)
3. Osteochondritis of femoral capital epiphysis
4. Slipped femoral capital epiphysis
5. Post-traumatic

Ultrasound is sensitive to detection fluid a common finding in hip pain. USG can detect fluid and guide aspiration of joint.

ANATOMY
Hip Joint – It is synovial ball-and-socket type of joint.



I. Materials And Methods

Patients were selected the orthopedics and Pediatrics O.P.D. as per following criteria :

1. Age below 12 years.
2. New cases of painful unilateral hips.
3. No cases with known previous hip pathologies.

First clinical assessment and X-ray of affected hip.

Then ultrasonography examination was done. Both affected and unaffected hips were examined. The maximum distension of joint capsule from the femoral neck was measured at a standardized position. A measurement 3mm or more in the affected side. A difference of greater than 2mm between the two hips was considered abnormal and diagnostic of joint effusion.

In case of suspected septic joint effusions, FNAC were done and fluid sent for laboratory tests. Fluid if appeared turbid and complex was suspected septic effusions sonologically.

Comparative study with the normal hip joint was performed in each sase. Patients diagnosed by USG were followed up by repeat USG examination after 3 weeks.

II. Result Analysis

A total number 50 (fifty) cases of unilateral painful hip joint were studied in this series. The following table shows distribution of different cases based on USG diagnosis

Table-I

Sl. No.	USG diagnosis	No. of cases	Percentage (%)
1.	Transient Synovitis	35	70
2.	Septic arthritis	6	12
3.	Septic arthritis + osteomyelities	2	4
4.	Trauma	2	4
5.	Perthes disease	4	8
6.	Tubercular arthritis	1	2

Following table is showing the Number and Percentage of cases in different clinical grads.

Table-II

Clinical grade	No. of cases	Percentage
Grade I	7	14%
Grade II	26	52%
Grade III	15	30%
Grade IV	2	4%

Table-III
Findings in Straight X-ray

Total No. of Case = 50

No. of cases	Findings	Percentage of total case
6	Evidence of joint effusion were suggested by fat plane displacement	12%
1	Cystic changes seen in epiphysis and apophysis and acetabular margin. ? Koch's	2%
39	No. obvious radiological abnormality detected	78%
3	Increased joint space with slightly flattened & dense epiphysis of femoral head	6%
1	Osteomyelitis in bones around hip.	4%

Table-IV
Comparative study of US and plain films in detecting effusion

Plain films	Sonography		Total for plain films	Total for sonogram
	Positive	Negative		
Positive 6	6	0	6	30
Negative 44	24	20	44	20

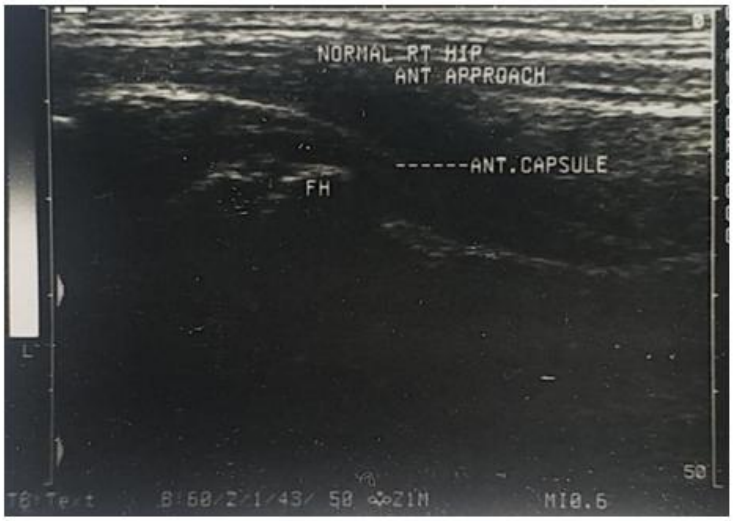
It is found that in 60% of cases sonogram detected the abnormality.

Plain film can detect the abnormality in only 6 cases (12%). No cases is found in this series where USG becomes negative but X-ray becomes positive.

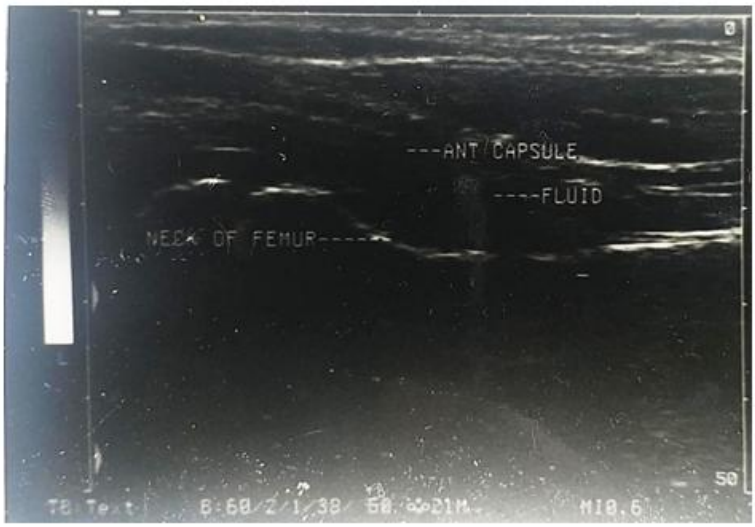
Table –V
Sonological Findings

Sonological findings	No. of cases	Percentage of total case
Evidence of joint effusion noted	30	60%
Muscle contusion	2	4%
Contour deformity of femoral capital epiphysis	2	4%
Infective change in bone	2	4%

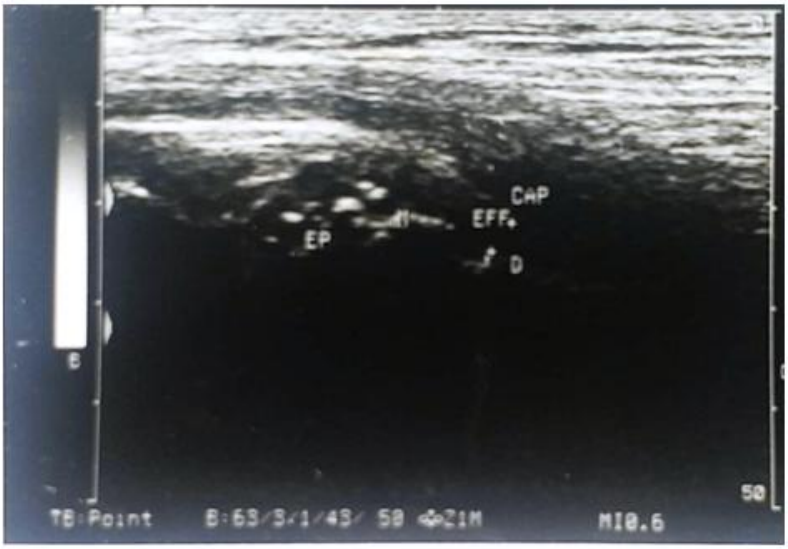
X-ray is marginally better in detecting epiphyseal deformity. But in follow-up, X-ray and USG was equally effective.



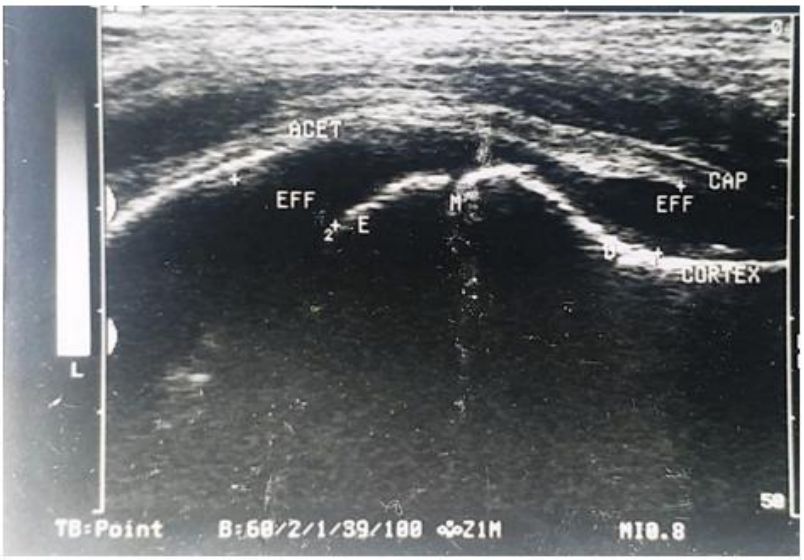
Normal hip joint (right side)



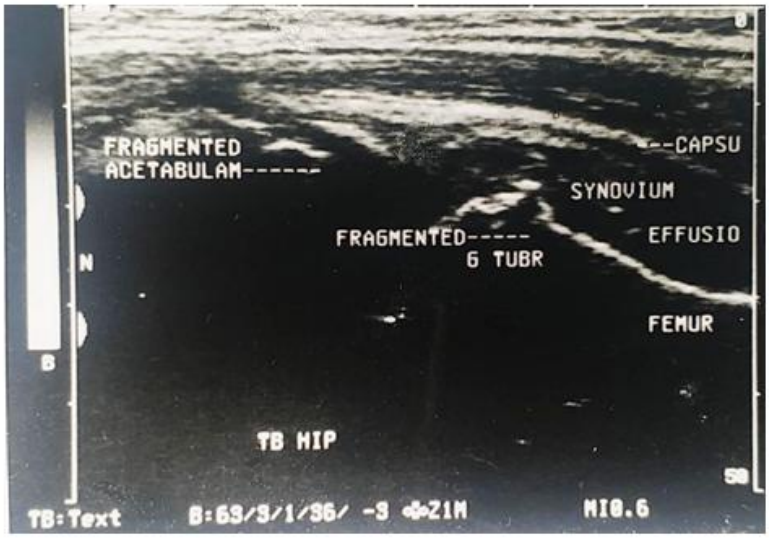
Transient Synovitis of left hip joint



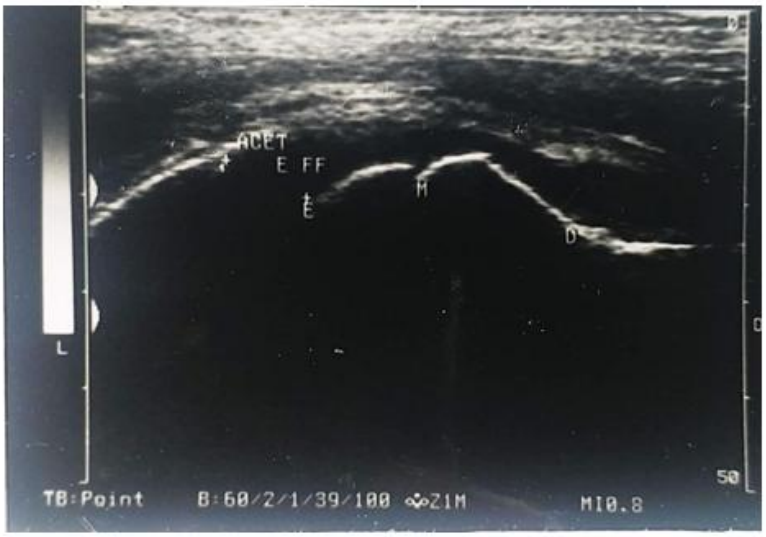
Legg. Calve Perthes disease



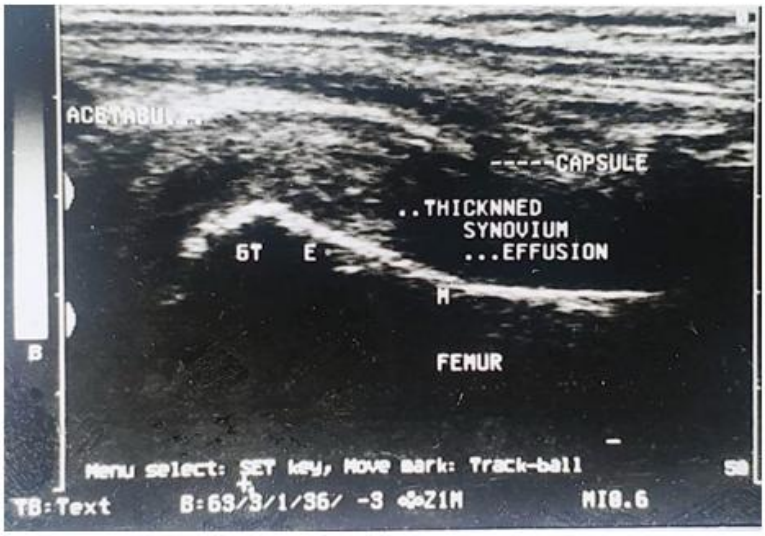
Transient synovitis



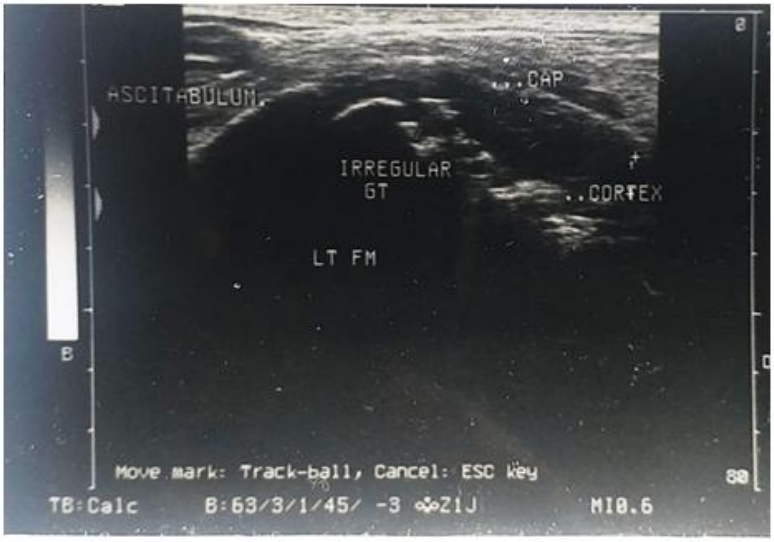
Tubercular Arthritis



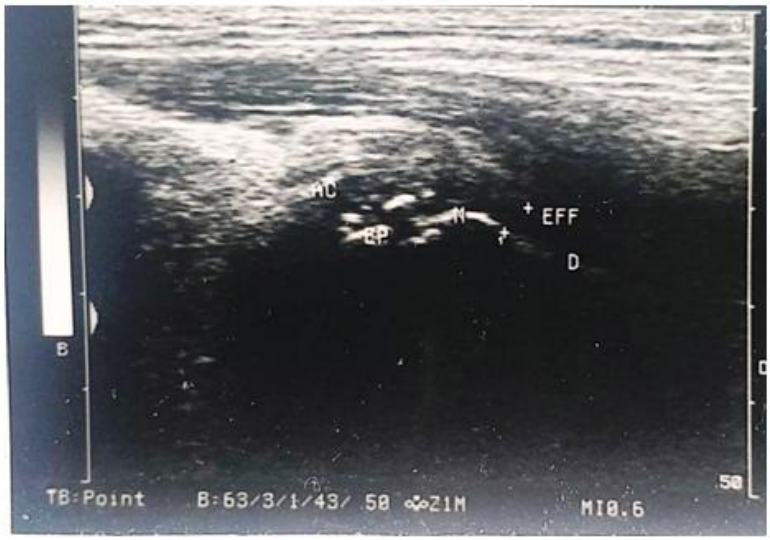
Transient Synovitis



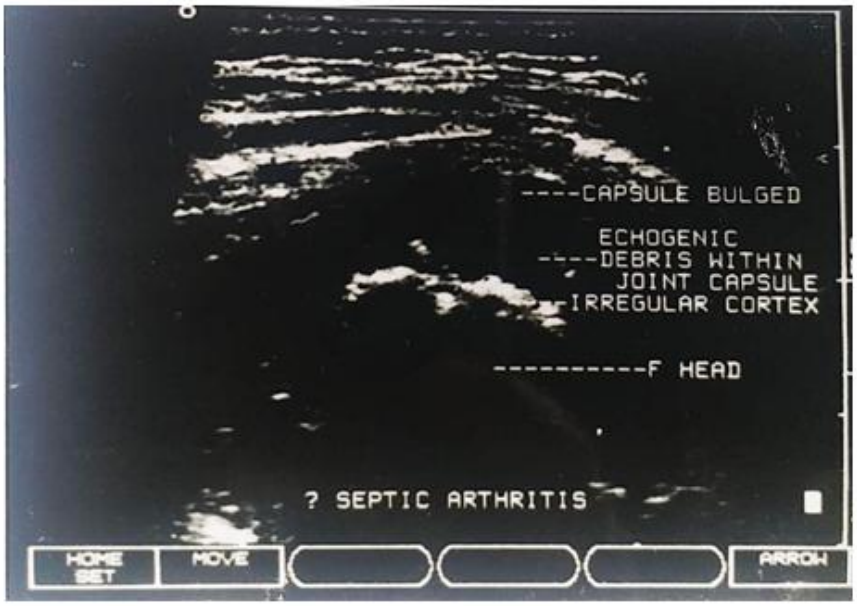
Septic Arthritis



Septic Arthritis with Osteomyelitis



Legg. Calve Perthes disease



Septic Arthritis

III. Discussion

Painful hip in pediatric age group is a common clinical problem in pediatrics and orthopedic.
Commonest causes in decreasing frequency are transient synoritis (70%), septic arthritis (12%), perthes disease (8%).
Effusion is a common finding in traumatic. USG has helped to diagnose joint effusion as X-ray is not sensitive to detect effusion. USG shows 100% sensitivity and specificity to sensitive joint effusion. X-ray can pick up only cases. Transient sinusitis shows echo free and septic arteries echofree joint effusion.

IV. Summary And Conclusion

Transient synovitis was formal to be the commonest cause of unilateral hip pain in pediatric age group.
Diagnosis of transient synovitis is mainly clinical. USG is used to exclude other pathologies.
Presence of echofree effusion exchanges transient synovitis and aspiration is reviewed. HRUSG is the method of choice in detecting and characterizing hip joint effusion. W-ray has almost no role.

Bibliography

[1]. Dean B Coid DR (1993) : Introduction of hip ultrasonography to the neonatal Services of a Fire District General Hospital. Health Serv Manage Res, May; 6 (2) : 74-7.
[2]. Eggl H, Drekonja T, Kaiser B et al (1989) : Ultrasonography in the diagnosis of transient Synovitis of the hip & legg – Calve Perthes disease. J Pediatr Orthop B, Jul; 8(3) : 177-80.
[3]. Eich GF, Furga-Superti A, Umbricht FS (1999) : The painfull hip : evaluation of criteria for clinical decision – making Eur Je Pediatr, Nov; 158 (11) : 923-8.
[4]. Harcke HT, Grissom LE (1999) : Pediatric hip sonography, Diagnosis & differential diagnosis. Radiol Clin North Am, Jul; 37 (4) : 787-96.
[5]. Nimityongskul P, Mc Bryde AM, Crotty JM et al (1996) : Ultrasonography in the management of painful hips in children. Am j Orthop, June, 25 (6) : 411-4.
[6]. Ribel TW, nasir R, Nazarenko O. (1996) the value of sonography in the detection of osteomyelitis, Pediatr Radiol 26 : 291-297.
[7]. Robben SG, Meradji M, Diepstraten AF et al (1998) : US of the painful hip in childhood : diagnostic value of cartilage thickening & muscle atrophy in the detection of perthes disease. Radiology, Jul; 208 (1) : 35-42.
[8]. Robben SGF et al (1999) : Anterior Joint Capsule of the normal hip and in children with thansient Synovitis : US study with anatomic and histologic correlation, Radiology 210 : 499-507.
[9]. Robben SG Lequin HM, Meradji M (1999) : Atrophy of the quadriceps muscle in children with a painfuk hip-lin Physiol, Sep; 19 (5) : 385-93.
[10]. Singh Kang, Preet, Pawa Sumedha, Dhal Awilk, Chowdhury Veena (1997) : Ultrasound in the evaluation of Painful hip in children. Ind J Radiol Imag, 7 (1) : 33-36.
[11]. Strouse PJ, dipietro MA, Adler RS. (1998) : Pediatric hip effusion; Evaluation with power Doppler sonography, Radiology 206 : 731-735.

Dr. Chaitali Chattopadhyay. "Evaluation of the Role of High Resolution High Frequency Ultrasonography in Painful Hip Pediatric Age Group." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(11), 2020, pp. 17-23.