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Evaluation of Outcomes in Perthes Diseases Treated at a Tertiary Referral Center in Bangladesh: A Study from 2017 to 2019

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Abstract

Background:

Legg-Calvé-Perthes disease (LCPD) is a childhood hip disorder due to idiopathic avascular necrosis of the femoral head. Management and outcomes vary based on age at onset, severity, and treatment modality. There is limited published data from South Asia, particularly from tertiary centers like BSMMU.

Objective:

To evaluate clinical and radiological outcomes of patients with Perthes disease treated at BSMMU from 2017 to 2019.

Methods:

This prospective observational study included 56 patients diagnosed with LCPD. Data were collected on demographic characteristics, clinical presentation, treatment modality, and outcomes over a minimum follow-up of 24 months. Outcome measures included radiological assessment using the Stulberg classification and clinical scoring using the modified Harris Hip Score (mHHS).

Results:

The mean age at diagnosis was 7.6 ± 1.8 years. Most common presenting symptom was limping (88%), followed by hip pain (76%). 36% underwent surgical intervention, while 64% received conservative management. At final follow-up, 62% had good radiological outcomes (Stulberg I or II), with better outcomes in the surgical group in children older than 8 years ($p<0.05$).

Conclusion:
Perthes disease in our cohort demonstrated favorable outcomes when age-appropriate treatment strategies were applied. Early detection and stratified management improved hip function and reduced deformity. Our findings support individualized treatment based on age, lateral pillar classification, and hip containment.
Keywords: Perthes disease, LCPD, avascular necrosis, BSMMU, pediatric orthopaedics, hip disorder

Introduction

Legg-Calvé-Perthes disease (LCPD) is an idiopathic avascular necrosis of the capital femoral epiphysis in children. Despite its global occurrence, regional differences in incidence and management exist. The disease typically affects children aged 4 to 10 years and is more common in males.

Management options range from conservative therapy (activity modification, NSAIDs, bracing, physiotherapy) to surgical containment procedures (varus osteotomy, Salter osteotomy). The prognosis is influenced by age at onset, stage at diagnosis, lateral pillar classification, and containment status.

In Bangladesh, literature on LCPD is sparse, and treatment protocols vary across institutions. This study aims to present a prospective evaluation of patients with LCPD treated at BSMMU, the premier tertiary care hospital in the country, over a three-year period.

Materials and Methods

Study Design:

Prospective observational cohort study.

Study Setting:

Department of Orthopaedics, BSMMU, Dhaka, Bangladesh.

Study Period:

January 2017 to December 2019, with follow-up until December 2020.

Inclusion Criteria:

- Children aged 4–12 years
- Diagnosed with unilateral or bilateral LCPD
- Follow-up for a minimum of 24 months
- Radiological evidence of avascular necrosis (Waldenstrom classification)

Exclusion Criteria:

- Traumatic hip conditions
- Sickle cell disease or systemic vasculitis
- Incomplete follow-up

Data Collection:

Data were collected using a standardized proforma:

- Age, sex, symptom duration, and side involved
- Lateral Pillar classification (Herring)
- Treatment received (surgical or conservative)
- Clinical outcomes using the modified Harris Hip Score (mHHS)

- Radiological outcomes using the Stulberg classification

Treatment Protocols:

- Children <6 years: Primarily conservative
- Children ≥8 years with Herring B or B/C hips: Surgical containment
- Physical therapy and NSAIDs were part of all regimens

Statistical Analysis:

Descriptive statistics were used to summarize demographics. Chi-square and t-tests were applied to compare groups. Statistical significance was defined as $p < 0.05$. SPSS v26.0 was used.

Results:

Table 1: Demographic and Clinical Characteristics of Patients (N = 56)

Parameter	Value
Mean age at diagnosis (years)	7.6 ± 1.8
Sex (Male:Female)	5:1
Laterality	Unilateral: 89%, Bilateral: 11%
Most common symptom	Limping (88%)
Second most common symptom	Hip/groin pain (76%)
Restricted ROM	54%

Table 2: Lateral Pillar Classification at Presentation

Herring Type	Number of Patients	Percentage (%)
A	12	21.4%
B	27	48.2%
C	17	30.4%

Table 3: Treatment Modalities Applied

Treatment Type	Number of Patients	Percentage (%)
Conservative (NSAIDs, activity modification, bracing, physiotherapy)	36	64.3%
Surgical (Varus osteotomy ± adductor tenotomy)	20	35.7%

Table 4: Radiological Outcomes at Final Follow-Up (Stulberg Classification)

Stulberg Type	Outcome Category	Number of Patients	Percentage (%)
I	Good	18	32.1%
II	Good	17	30.4%
III	Fair	12	21.4%
IV/V	Poor	9	16.1%

Table 5: Clinical Outcome (Modified Harris Hip Score - mHHS)

Group	Mean mHHS ± SD	Significance (p-value)
Conservative treatment	80.6 ± 6.8	
Surgical treatment	88.2 ± 5.4	**p = 0.032** (significant)

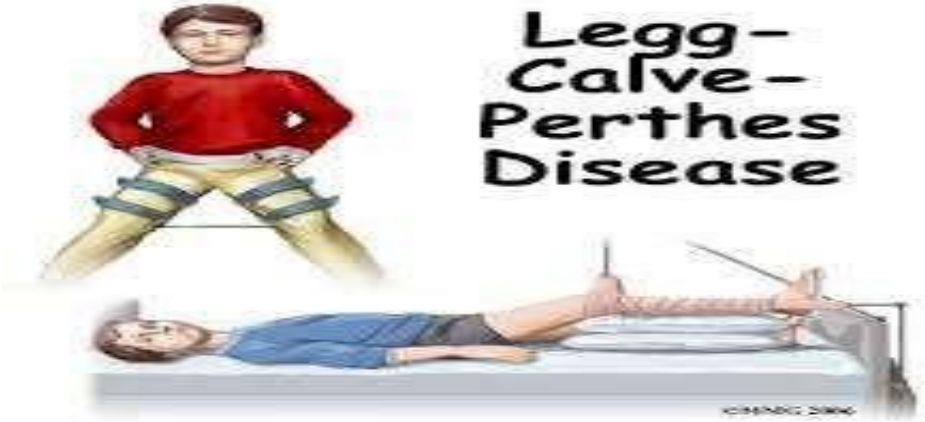

Figure-1: Conservative Treatment modalities

Figure-2: Operative Treatment modalities

Discussion

Our study supports the age- and classification-based management approach in Perthes disease. Consistent with global data, the majority of children under 6 years had excellent outcomes with non-operative management. However, patients older than 8 years with Herring B/C hips benefited from surgical containment procedures. The higher male prevalence and unilateral involvement match known epidemiological patterns. Compared to Western cohorts, delayed presentation is a challenge in our setting, highlighting the need for public awareness and early referral.

Our radiological outcomes align with studies by Herring et al. and Joseph et al., suggesting that containment surgery improves spherical remodeling and hip congruity when indicated.

Limitations:

- Moderate sample size
- Single-center study
- Surgical outcomes may vary by surgeon expertise
- Lack of gait and quality-of-life analysis

Conclusion

This prospective study demonstrates that individualized treatment protocols based on age and severity produce good clinical and radiological outcomes in children with Perthes disease. Timely surgical intervention in appropriate patients significantly improves results. Future multicenter studies from Bangladesh could refine treatment algorithms and optimize care.

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