

Original Research Article
To evaluate diagnostic criteria for Avascular Necrosis of Femoral Head

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Abstract:

Background & Method: The aim of the study is to evaluate diagnostic criteria for Avascular Necrosis of Femoral Head. Painful hips were taken up for studying the clinical, radiological and MRI findings suggestive of avascular necrosis. This clinical findings on each hip (right and left) were studied separately and were correlated with radiographic and MRI findings.

Result: The sex distribution was 68 male and 22 female indicating male preponderance of 3:1. Showing idiopathic followed by Alcohol induced was the commonest etiology. Most of the patients (71.11%) had bilateral involvement. It shows as the MRI stage progress percentage of necrotic area of head was also increased.

Conclusion: Avascular necrosis of the hip should be highly suspected in patients presenting with groin pain and unremarkable examination findings especially with associated risk factors. The diagnostic criteria given by Japanese investigation Committee was found to be effective in diagnosing changes of AVN.

Keywords: diagnostic, avascular, necrosis & femoral head.

Study Designed: Observational Study.

1. INTRODUCTION

Osteonecrosis or avascular necrosis is a poorly understood condition. There is no uniformly accepted definition and theories abound regarding its aetiopathogenesis[1]. When avascular necrosis of the femoral head follow a fracture of the femoral neck or a dislocation on the hip, there is a clear association between the mechanical compromise to the vessels supplying the femoral head and the subsequent avascular necrosis[2].

The mechanism is not well understood for avascular necrosis due to other causes. In these instances the etiology is often presumed on the basis of an association with a particular risk factor. For example, the Japanese Investigation Committee, performed careful epidemiological studies in which alcohol was implicated as a risk factor for avascular necrosis, reported the prevalence of osteonecrosis to be 4% to 20% in people with various haemoglobinopathies[3].

Osteonecrosis that occurs after femoral neck fractures and hip dislocation is a direct result of injury to the arteries and veins that supply a significant portion of the femoral head. Angiographic studies in cases of non-traumatic osteonecrosis have demonstrated a high incidence of abnormalities in major vessels about the hip, including the retinacular arteries[4]. Superselective microangiographic studies of preclinical and contralateral "normal" hips have been consistent with a diagnosis of intraosseous vascular occlusion[5].

Osteonecrosis may be encountered after various surgical procedures about the hip, as well as after forceful manipulation and casting in extreme positions. These are related to iatrogenic trauma to regional vessels[6].

2. MATERIAL & METHOD

This is multicentric retrospective study was carried out in the department of Orthopaedics at LNCT Sevakunj Medical College, Indore, M.P., Bundelkhand Medical College, Sagar & St. Francis Hospital, Indore, M.P. from Feb 2021 to March 2022. A total of 90 patients (154 Hips) with painful hips were taken up for studying the clinical, radiological and MRI findings suggestive of avascular necrosis. This clinical findings on each hip (right and left) were studied separately and were correlated with radiographic and MRI findings.

Inclusion Criteria:

Individuals (in the age group of 18-65 yrs.) with painful hip(s) with or without restriction of movements /or limp, having risk factors for AVN like alcohol, steroid, sickle cell disease, pregnancy, radiation etc. and who did not satisfy any of the following exclusion criteria were included in the study.

Exclusion Criteria:

- 1) Any significant history suggestive of fractures –Operated /Non-operated.
- 2) Congenital anomalies involving the hip.
- 3) Neuromuscular disorders such as muscular dystrophies, cerebral palsy, poliomyelitis sequelae etc.

3. RESULTS**Table No. 1: The sex distribution**

S. No	Sex	No of pts.	Percentage
1	Male	68	75.60
2	Female	22	24.4
	Total	90	

The sex distribution was 68 male and 22 female indicating male preponderance of 3:1.

Table No. 2: Etiological Distribution

S. No.	Etiology	No. of Subjects	Percent of distribution
1.	Idiopathic	50	55 %
2.	Alcohol Induced	24	26.66 %
3.	Steroid Induced	10	11.11 %
4.	Sickle cell disease	02	2.22 %
5.	Post Pregnancy	02	2.22 %
6.	Radiation Induced	02	2.22 %
	Total	90	

Showing idiopathic followed by Alcohol induced was the commonest etiology.

Table No. 3: Laterality Distribution

S. No.	Laterality	No. of Pts.	Percentage
1	Unilateral	26	28.88
2	Bilateral	64	71.11
	Total	90	

Most of the patients (71.11%) had bilateral involvement

Table No. 4: Extent of osteonecrosis in MRI.

S. No.	MRI Stage	Area of Involvement in Percentage				
		0 –10	11 –20	21 –30	31 –40	41 -50
1.	I	04	00	00	00	00
2.	II	06	10	02	00	00
3.	III	02	06	04	02	00
4.	IV	00	02	04	04	00
5.	V	00	00	00	02	04
6.	VI	00	00	00	00	00
	Total	12	18	10	08	04

It shows as the MRI stage progress percentage of necrotic area of head was also increased.

4. DISCUSSION

Avascular Necrosis is a debatable topic for many years. Various diagnostic modalities have been used to diagnose and stage the condition but none had proved completely satisfactory. Detecting the disease at the early stage is very important because early diagnosis and its optimal treatment improves the prognosis of the disease & prevents significant disability[7].

A prompt diagnosis of osteonecrosis allows early treatment and this invariably results in better outcome. As with any diagnosis, the history is critical. The most common presenting symptom is a deep pain in the groin with difficulty in sitting crossleg and squatting[8]. A high index of suspicion is essential, especially if the patient has one of the atraumatic conditions associated with osteonecrosis. An associated risk factor should be sought out during the initial evaluation. However, in this study it was noted that out of 77 hips 25 hips (55.55 %) had no associated risk factors while their radiographs & MRI if done showing changes of avascular necrosis.

The findings of physical examination can be unremarkable or can include pain on internal rotation of hip, a decreased range of motion, an antalgic gait, axis deviation and clicking in the hip when the necrotic fragment has collapsed. Pain with internal rotation of the hip & a limited range of hip motion are often signs that the femoral head has already flattened. In our study the above findings were noted and confirmed with majority of patients having decreased range of rotational movements[9]. In our study majority of the hips (28.57 %) presented in grade IV this can be attributed to delay in usage of appropriate diagnostic tools that helps in early diagnosis of Avascular Necrosis of Femoral Head.

5. CONCLUSION

Avascular necrosis of the hip should be highly suspected in patients presenting with groin pain and unremarkable examination findings especially with associated risk factors. The diagnostic criteria given by Japanese investigation Committee was found to be effective in diagnosing changes of AVN.

6. REFERENCES

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