

Analysis of Various Treatment Modalities of Idiopathic Avascular Necrosis of Hip

Y Rajshekhar Krishna K

Assistant Professor, Department of Orthopaedics,
Major SD Singh Medical College and Hospital, Fatehgarh, Farrukhabad, Uttar Pradesh, India.

ABSTRACT

Background: The educated, timely management and triage of patients suspected of having idiopathic avascular necrosis (IAVN) of the hip could minimize advanced surgical procedures. Hence; the present study was conducted with the aim of analysing various treatment modalities of idiopathic avascular necrosis of hip.

Materials & Methods: A total of 20 patients with confirmed diagnosis of idiopathic avascular necrosis of hip. Complete demographic and clinical details of all the patients were obtained. A Performa was made and detailed clinico-radiographic findings of all the patients was analysed. Treatment planning was done and outcome was assessed on follow-up. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: In 55 percent of the patients, AVN was bilateral while in 25 percent and 20 percent of the patients, left side and right side was involved respectively. Core decompression was seen in 15 percent of the patients while core decompression with fibular graft was done in 30 percent of the patients. THR was done in 55 percent of the patients.

Conclusion: In patients with AVN of femoral head, early

diagnosis and intervention prior to collapse of the femoral head is the key to a successful outcome of joint preserving procedures. Core decompression with or without fibular grafting in early stages is an effective modality to delay the progression of the disease. In advanced cases, THR is recommended.

Key words: Idiopathic, Avascular, Necrosis.

*Correspondence to:

Dr. Y Rajshekhar Krishna K,
Assistant Professor,
Department of Orthopaedics,
Major SD Singh Medical College and Hospital,
Fatehgarh, Farrukhabad, Uttar Pradesh, India.

Article History:

Received: 19-03-2017, Revised: 07-04-2017, Accepted: 29-04-2017

Access this article online	
Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2017.3.3.101	

INTRODUCTION

The educated, timely management and triage of patients suspected of having AVN of the hip could minimize advanced surgical procedures and maintain the viability of the femoral head—an issue of prime importance, especially in younger patients.¹⁻³

Misdiagnoses and clinical silence are the two main reasons that the annual incidence of IAVN of the hip is hard to quantify. The numerous purported etiologies concerning the development of IAVN substantially broaden the list of potential risk factors. The incidence of IAVN ranges from 5% to 25% of patients on prolonged corticosteroid treatment. This population of individuals most certainly will seek chiropractic help for conditions such as asthma, systemic lupus erythematosus, and rheumatoid arthritis. Inflammatory arthritides also carry an additional risk in that many are associated with vasculitis that may affect the deep branch of the medial femoral circumflex artery, which is the predominant blood supply to the femoral head.⁴⁻⁶

Radiography should be the first diagnostic imaging modality performed in suspected cases of IAVN of hip or in cases of chronic hip pain that is non-responsive to therapy. Radiography is classically insensitive for the early detection of osseous pathology and magnetic resonance imaging (MRI) is ordered when radiographs are negative, but hip pathology is suspected. Staging the severity of ONFH is best done by combining clinical findings, including the presence of risk factors, with the radiographic and MRI findings.⁶⁻⁸ Hence; the present study was conducted with the aim of analysing various treatment modalities of idiopathic avascular necrosis of hip.

MATERIALS & METHODS

The present study was conducted at Department of Orthopaedics, Major SD Singh Medical College and Hospital, Fatehgarh, Farrukhabad, Uttar Pradesh (India) with the aim of analysing various treatment modalities of idiopathic avascular necrosis of

hip. A total of 20 patients with confirmed diagnosis of idiopathic avascular necrosis of hip. Complete demographic and clinical details of all the patients were obtained.

Exclusion Criteria

- Diabetic patients
- Hypertensive patients
- Patients with presence of malignant neoplasm

A Performa was made and detailed clinico-radiographic findings of all the patients was analysed. Treatment planning was done, and outcome was assessed on follow-up. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi-square test was used for evaluation of level of significance.

RESULTS

35 percent of the patients belonged to the age group of 41 to 50 years while 25 percent of the patients belonged to the age group of 30 to 40 years. Mean age of the patients was 46.1 years. 70 percent of the patients were males while the remaining 30 percent of the patients were females. In 55 percent of the patients, AVN was bilateral while in 25 percent and 20 percent of the patients, left side and right side was involved respectively. Core decompression was seen in 15 percent of the patients while core decompression with fibular graft was done in 30 percent of the patients. THR was done in 55 percent of the patients.

Table 1: Age-wise distribution

Age group (years)	n	%
Less than 30	3	15
30 to 40	5	25
41 to 50	7	35
51 to 60	1	5
More than 60	4	20
Total	20	100
Mean ± SD	46.1 ± 13.5	

Table 2: Gender-wise distribution

Gender	n	%
Males	14	70
Females	6	30
Total	20	100

Table 3: Site of AVN

Site of AVN	n	%
Left	5	25
Right	4	20
Bilateral	11	55
Total	20	100

Table 4: Treatment

Treatment	n	%
Core decompression	3	15
Core decompression with fibular graft	6	30
THR	11	55
Total	20	100

DISCUSSION

Osteonecrosis of the femoral head (ONFH) is caused by inadequate blood supply leading to death of the osteocytes. Subsequently it progresses to collapse of the femoral head and advanced joint destruction. ONFH thus leads to significant disability in the most productive years of life and is one of the common causes of hip arthroplasty in young individuals. Both traumatic and nontraumatic etiologies have been described for ONFH. The common causes include corticosteroid medications, fractures and dislocations of hip joint and chronic alcohol intake. In about 30% patients, it is idiopathic. Bilateral presentation is frequently seen and males are more commonly affected. Contralateral hip may be affected in about 55% of the patients within 2 years. About 75% of patients with other sites of involvement will have concurrent ONFH.⁶⁻⁹ Hence; the present study was conducted with the aim of analysing various treatment modalities of idiopathic avascular necrosis of hip.

In the present study, 35 percent of the patients belonged to the age group of 41 to 50 years while 25 percent of the patients belonged to the age group of 30 to 40 years. Mean age of the patients was 46.1 years. 70 percent of the patients were males while the remaining 30 percent of the patients were females. Yin TC et al investigated the angiogenesis and osteogenesis effects of shockwaves on bone marrow stromal cells (BMSCs) from hips with osteonecrosis. BMSCs were harvested from the bone marrow cavity of the proximal femur in six patients with osteonecrosis of the femoral head. The specimens were divided into four groups, the control, shockwave, shockwave plus nw-nitro- L-arginine methyl ester (L-NAME) and a nitric oxide (NO) donor (NOC18) groups. The control group received no shockwaves and was used as the baseline. The shockwave group received 250 shockwave impulses at 14 Kv (equivalent to 0.18 mJ/mm² energy flux density). The shockwave plus LNAME group was pre-treated with L-NAME before receiving shockwaves. The NOC18 group received NOC18 after cell culture for 48 hours. The evaluations included cell proliferation (MTT) assay, alkaline phosphatase, real time reverse transcriptase-polymerase chain reaction analysis of vessel endothelial growth factor (VEGF), bone morphogenic protein (BMP)-2, RUNX2 and osteocalcin mRNA expression and von Kossa stain for mineralized nodules. The shockwave group showed significant increases in MTT, VEGF, alkaline phosphatase, BMP2, RUNX2 and osteocalcin mRNA expression and more mature mineralized nodules compared with the control. Pre-treatment with L-NAME significantly reduced the angiogenic and osteogenic effects of extracorporeal shockwave therapy (ESWT) and the results were comparable with the control. Administration of NOC18 significantly enhanced the angiogenesis and osteogenesis effects compared with the control and the results were comparable with the shockwave group. ESWT significantly enhanced the angiogenic and osteogenic effects of BMSCs mediated through the NO pathway in hips with osteonecrosis.¹⁰

In the present study, in 55 percent of the patients, AVN was bilateral while in 25 percent and 20 percent of the patients, left side and right side was involved respectively. Core decompression was seen in 15 percent of the patients while core decompression with fibular graft was done in 30 percent of the patients. THR was done in 55 percent of the patients. Sen RK et al analysed results of core decompression and autologous bone

marrow mononuclear cells instillation in femoral head osteonecrosis. Fifty-one osteonecrotic hips in 40 patients were randomly divided into 2 treatment groups. Patients in group A (25 hips) were treated with core decompression, and those in group B (26 hips) received autologous bone marrow mononuclear cell instillation into the core tract after core decompression. Outcome between the 2 groups were compared clinically (Harris Hip score), radiographically (x-ray and magnetic resonance imaging), and by Kaplan-Meier hip survival analysis after 12 and 24 months of surgical intervention. The clinical score and mean hip survival were significantly better in group B than in group A ($P < .05$). Patients with adverse prognostic features at initial presentation that is, poor Harris Hip score, x-ray changes, edema, and/or effusion on magnetic resonance imaging had significantly better clinical outcome and hip survival in group B than in group A.¹¹ Deveci A et al evaluated the clinical and radiologic outcomes in patients diagnosed with grade 1 and 2 avascular necrosis of the femoral head who were treated with a combination of core decompression and hyperbaric oxygen therapy. They have evaluated 21 hips of 16 patients retrospectively, which they have treated with a combination of core decompression and hyperbaric oxygen therapy. They performed clinical and radiological evaluation to the patients. VAS and Harris hip scores showed improvement in all of their patients except in short term results. Core decompression and subsequent hyperbaric oxygen therapy are accomplishing each other because of their synergistic effects.¹²

CONCLUSION

In patients with AVN of femoral head, early diagnosis and intervention prior to collapse of the femoral head is the key to a successful outcome of joint preserving procedures. Core decompression with or without fibular grafting in early stages is an effective modality to delay the progression of the disease. In advanced cases, THR is recommended.

REFERENCES

1. Delloye C, Cornu O. Cortical bone allografting in femoral head necrosis. *Acta Orthop Belg* 1999;65(Suppl 1):57-61.
2. Mont M, Fairbank A, Krackow K, Hungerford D. Corrective osteotomy for osteonecrosis of the femoral head. *J Bone Joint Surg Am* 1996;78:1032-8.
3. Scott R, Urse J, Schmidt R, Bierbaum B. Use of TARA hemiarthroplasty in advanced osteonecrosis. *J Arthroplasty* 1987;2:225-32.
4. Kang P, Pei F, Shen B, Zhou Z, Yang J. Are the results of multiple drilling and alendronate for osteonecrosis of the femoral head better than those of multiple drilling? A pilot study. *Joint Bone Spine*. 2012;79:67-72.

5. Hsu SL, Wang CJ, Lee MS, Chan YS, Huang CC, Yang KD. Cocktail therapy for femoral head necrosis of the hip. *Arch Orthop Trauma Surg*. 2010;130:23-9.
6. Wong T, Wang CJ, Hsu SL, Chou WY, Lin PC, Huang CC. Cocktail therapy for hip necrosis in SARS patients. *Chang Gung Med J*. 2008;31:546-53.
7. Wang CJ, Wang FS, Yang KD, Huang CC, Lee MS, Chan YS, et al. Treatment of osteonecrosis of the hip: Comparison of extracorporeal shockwave with shockwave and alendronate. *Arch Orthop Trauma Surg*. 2008;128:901-8.
8. Scully SP, Aaron RK, Urbaniak JR. Survival analysis of hips treated with core decompression or vascularized fibular grafting because of avascular necrosis. *J Bone Joint Surg Am* 1998;80:1270-5.
9. Inao S, Ando M, Gotoh E, Matsuno T. Minimum 10-year results of Sugioka's osteotomy for femoral head osteonecrosis. *Clinical Orthop* 1999;368:141-8.
10. Yin TC, Wang CJ, Yang KD, Wang FS, Sun YC. Shockwaves enhance the osteogenetic gene expression in marrow stromal cells from hips with osteonecrosis. *Chang Gung Med J*. Jul-Aug 2011;34(4):367-74.
11. Sen RK, Tripathy SK, Aggarwal S, Marwaha N, Sharma R, Khandelwal N. Early results of core decompression and autologous bone marrow mononuclear cells instillation in femoral head osteonecrosis: a randomized control study. *J Arthroplasty*. 2012 May;27(5):679-86.
12. Deveci A, Firat A, Yilmaz S, Ünal KO, Tecimel O, Bozkurt M, Atabey M. Treatment of femoral head osteonecrosis with core decompression and subsequent hyperbaric oxygen therapy. *Cumhuriyet Tıp Derg* 2013; 35: 231-8.

Source of Support: Nil.

Conflict of Interest: None Declared.

Copyright: © the author(s) and publisher. IJMRP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882.

This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article as: Y Rajshekhar Krishna K. Analysis of Various Treatment Modalities of Idiopathic Avascular Necrosis of Hip. *Int J Med Res Prof*. 2017; 3(3): 469-71.
DOI: 10.21276/ijmrp.2017.3.3.101