Original Research Article

A case series (15 cases) of core decompression with intraoosseous ibandronate in low grade AVN of femoral head - A novel technique

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Abstract

Background: Osteonecrosis of the femoral head (ONFH) is a debilitating disease. The etiology of the disease is unknown. **Aims and Objective :** To study effectiveness of core decompression with intraoosseous ibandronate in low grade AVN of femoral head-a novel technique. **Methodology:** This was a case series of 15 patients AVN of femoral head at tertiary health care centre during the six month period January 2019 to June 2019 all the patients who were having the AVN of Femoral head were evaluated clinically by Modified Harris hip score. By the written and explained consent all the patients undergone a novel technique i.e. core decompression with intraoosseous ibandronate with all standard protocols. All the patients followed up. The statistical analysis was done by un-paired t-test calculated by SPSS 19 version software. **Result :** In Our study we have seen the average time since intervention in the patients was 34.47 ±10.92 , the Modified Harris hip score was significantly higher after post intervention i.e. 94.60±3.16 as compared to 74.13±10.78 ($p< 0.0001$; $t=6.816$,$df=28$) ; The VAS score significantly lower in after intervention i.e. 1.07±0.77 as compared to 5.07± 1.24 ($p< 0.0001$; $t=10.27$, $df=28$) . Most of the patients were associated with Co-morbidities like -DM-4, HTN-3, COPD-2. **Conclusion:** It can be concluded from our study that the core decompression with intraoosseous ibandronate in low grade AVN of femoral was effective with respect to increase of Modified Harris hip score and decreased pain with respect to less VAS.

Keywords: AVN Femoral Head, core decompression, intraoosseous ibandronate, Visual Analogue Score (VAS).

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INTRODUCTION

Osteonecrosis of the femoral head (ONFH) is a debilitating disease.[1-3] The etiology of the disease is unknown.[4,5] However, it is thought to be multifactorial.[6-8] It results in femoral head collapse in 75–85% of untreated patients.[9-14] The current trend in the treatment of ONFH aims to preserve the joint in the initial stages and to delay the replacement surgery in advanced cases.[14] Bisphosphonates are a class of drugs that can bind to the bone and inhibit osteoclast activity by reducing bone resorption [15–17]. They are usually used to treat diseases involving bone resorption progression, such as osteoporosis, Paget's disease, and fibrous dysplasia[17–19]. Bisphosphonates has also been considered a promising medication for early ONFH and

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preventing femoral head collapse.[20–23] So in our study we have seen the effectiveness of core decompression with intraoosseous ibandronate in low grade AVN of femoral head-a novel technique at tertiary health care centre.

Methodology: This was a case series of 15 patients AVN of femoral head at tertiary health care centre during the six month period January 2019 to June 2019 all the patients who were having the AVN of Femoral head were evaluated clinically by Modified Harris hip score. By the written and explained consent all the patients undergone a novel technique i.e. core decompression with intraoosseous ibandronate with all standard protocols. All the patients followed up. The statistical analysis was done by un-paired t-test calculated by SPSS 19 version software.

Table 1: Distribution of the patients as per the clinico- demographic characters

ID	Age	Sex	Side affected	Co-morbidities
1	34	M	L	HTN,DM
2	56	F	L	-
3	72	M	R	-
4	32	M	L	-
5	43	M	R	Obesity
6	34	M	R	DM
7	31	F	L	COPD
8	39	M	L	DM
9	40	M	L	HTN
10	49	F	R	-
11	52	M	L	-
12	65	F	R	-
13	43	M	L	DM
14	31	M	L	HTN
15	47	M	R	COPD

(M-Male,F-Female,HTN-Hypertesnion,DM-Diabetes Mellitus, COPD-Chronic Obstructive Pulmonary Disease) The average age of the patients was (Mean ±SD) - 44.53 ±12.50 , majority of the patients were Males i.e. -11 and females i.e. 4 most of the affected side was Left i.e. 9 and Right was in 6.

Table 2: Distribution of the patients as per the various parameters

Patient ID	Time since intervention (Months)	Modified Harris hip score		VAS		
		Pre	Post	Pre	Post	
1	50	87	98	7	1	HTN,DM
2	35	71	94	5	2	-
3	19	62	94	5	1	-
4	31	64	97	3	0	-
5	39	75	92	6	2	Obesity
6	52	91	97	6	2	DM
7	46	81	95	5	1	COPD
8	36	91	95	4	0	DM
9	43	78	97	3	0	HTN
10	27	69	98	7	2	-
11	26	71	86	4	1	-
12	43	87	97	5	1	-
13	21	65	92	6	0	DM
14	34	61	96	4	1	HTN
15	15	59	91	6	2	COPD
Average	34.47	74.13	94.60	5.07	1.07	
SD	10.92	10.78	3.16	1.24	0.77	
p-value		p< 0.0001; t=6.816,df=28		p< 0.0001; t=10.27, df=28		

The average time since intervention in the patients was 34.47 ±10.92 , the Modified Harris hip score was significantly higher after post intervention i.e. 94.60±3.16 as compared to 74.13±10.78 (p< 0.0001; t=6.816,df=28) ; The VAS score significantly lower in after intervention i.e. 1.07±0.77 as compared to 5.07± 1.24 (p< 0.0001; t=10.27, df=28) . Most of the patients were associated with Co-morbidities like -DM-4, HTN-3, COPD-2.

DISCUSSION

Osteonecrosis of the femoral head (ONFH) is a common debilitating disease that occurs in young and middle-aged adults.[24,25] In fact, children also suffer from ONFH with an incidence of 8.5–21 per 100 000, but in this population, it is called Perthes disease.[26,30] Although the progressions of adult ONFH and Perthes disease differ, both conditions result in femoral head deformity or collapse. Therefore, preventing femoral head collapse is a significant treatment goal [28,29] . Te pathogenesis of ONFH remains unclear, but an imbalance of bone metabolism is considered one of the most important causes.[30] When ONFH occurs, bone formation fails to keep pace with bone resorption, resulting in low bone mineral density in the femoral head and the progression to collapse.[31] Therefore, clinicians must take measures to reduce bone resorption and improve osteogenesis when treating ONFH. Although many animal studies [34, 35] and clinical trials [32,33] have proven the efficiency of bisphosphonates in the treatment of ONFH, other researchers maintain different opinions. In clinical studies, Lee YK, *et al* used zoledronate to treat patients with Steinberg stage I or II ONFH with a medium to large necrotic area, but their outcomes show that zoledronate does not prevent collapse of the femoral head or reduce the need for total hip arthroplasty. Chen CH, *et al* conducted a multicenter, prospective, randomized, double-blind, placebo-controlled study using alendronate to prevent femoral head collapse but concluded that alendronate had no obvious effects on decreasing the need for THA and cannot reduce disease progression or improve quality of life . Moreover, the animal studies of Aruwajoye OO, *et al* [36] and Zou Y, *et al* [37] showed that the use of ibandronate alone did not. Obviously improve osteonecrosis, while the combination of ibandronate and other drugs such as BMP-2 or simvastatin could exert better protective effects. In Our study we have seen the average time since intervention in the patients was 34.47 ±10.92 , the Modified Harris hip score was significantly higher after post intervention i.e. 94.60±3.16 as compared to 74.13±10.78 ($p< 0.0001$; $t=6.816, df=28$) ; The VAS score significantly lower in after intervention i.e. 1.07±0.77 as compared to 5.07± 1.24 ($p< 0.0001$; $t=10.27$, $df=28$) . Most of the patients were associated with Co-morbidities like -DM-4, HTN-3, COPD-2. These findings are similar to Ahmed M Samy *et al* [38] they found A prospective study of 40 hips in 30 patients was done. There were 19 males and 11 females with a mean age 36.7 ± 6.93 years. The indication for the operation was restricted primarily to modified Ficat stages IIb and III. 16 hips (40%) had stage IIb and 24 hips (60%) had stage III ONFH. The period of follow up ranged between 36–50 months with a mean 41.4 ± 3.53 months. All patients were assessed clinically during pre- and post-operative period according to the Harris Hip Score (HHS), Visual Analog Score (VAS) and radiologically by X-rays. Magnetic resonance imaging (MRI) was done preoperatively to confirm the diagnosis and every 6 months postoperatively for assessment of healing. The operative procedure include removal of necrotic area with drilling then the cavity was filled with a composite of bone graft mixed with PRP. The mean HHS improved from 46.0 ± 7.8 preoperatively to 90.28 ± 19 at the end of follow up ($P < 0.0001$). The mean values of VAS were 78 ± 21 and 35 ± 19 at preoperatively period and final follow up, respectively, with an average reduction of 43 points.

CONCLUSION

It can be concluded from our study that the core decompression with intraoosseous ibandronate in low grade AVN of femoral was effective with respect to increase of Modified Harris hip score and decreased pain with respect to less VAS.

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