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## **Modified Light bulb Procedure Results in Superior Clinical Outcomes in Femoral Head Osteonecrosis**

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# Objectives

- Osteonecrosis of the femoral head (ONFH) is the cause of 10-15% of THA cases in the US.
- In the United States, about 10,000 to 20,000 new cases are diagnosed every year, and the patients with this disease, after becoming symptomatic, mainly progress to collapse of the femoral head and eventually destruction of the hip joint.
- There is a lot of controversy in choosing the treatment method for patients. Among the treatment methods used are percutaneous multiple drilling and the light bulb procedure.

# Methods

- People aged 18 to 60 years old with non-traumatic ONFH who did not have femoral head collapse and underwent surgery by multiple drilling or light bulb method was included in this study.
- Two groups were examined to assess pain by completing the standard VAS questionnaire and to assess the functional status by completing the standard Harris Hip score (HHS) questionnaire and the standard HOOS questionnaire, before surgery and after surgery at intervals of 1, 6, and 12 months.

# Methods

- Radiographic evaluations were performed according to the above months and MRI before surgery.
- Simple anteroposterior and frog-leg radiographs were performed, and by using Ficat-Arlet classification, ARCO classification, and calculating Kerbol's combined necrosis angle, the stage of the disease and the extent of the lesion were determined.

# Methods

1, 6, and 12 months after surgery, simple anteroposterior and frog-leg radiographs were performed and the status of radiographic changes was determined based on the Ficot-Arlet classification at 12 months after surgery

# Surgical Technique

- In the lightbulb method, the femoral head-neck junction is approached with a Direct anterior approach (DAA).
- The fascia of the TFL is incised and the TFL muscle belly is retracted laterally and sartorius retracted.
- Anteromedially, the rectus femoris heads, are identified and the plane between the rectus and the anterior hip capsule is developed.
- A T-shaped incision is performed in the anterior capsule. Based on the location of the maximum necrotic area in radiography and MRI, a window measuring about 2 x 2 cm is opened at the femoral head-neck junction

# Results

- A total of 51 hip joints in 38 patients were included in the study.
- Hip pain after surgery, based on VAS, was significantly reduced in both groups compared to before surgery ( $p < 0.001$ ) and the light bulb method performed better compared to the multiple drilling methods in reducing patients' pain ( $p = 0.01$ ).
- Hip function 12 months after surgery, based on HOOS and Harris hip score, had a significant improvement in both groups compared to before surgery ( $p < 0.001$ ) and the light bulb method had better results in improving hip function based on HOOS score. ( $p = 0.03$ ).



# Conclusion

- Both multiple drilling and lightbulb methods are effective in reducing pain and improving the performance of patients with ONFH in the pre-collapse stage.
- The results of the light bulb method in reducing pain and improving the performance of patients were better than the results of the multiple drilling methods.
- Keywords: Osteonecrosis, Light bulb, Multiple drilling, Total hip arthroplasty
- Level of Evidence: 2

# Significance of the findings Questions

- The primary findings of our study indicate that the modified LB procedure, utilizing the DAA approach, yields promising outcomes and demonstrates a slight superiority over multiple drilling in short-term follow-up for pre-collapsed ONFH.