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## Efficacy of core decompression with fibula graft addition in grade 2 avascular necrosis of the hip: A prospective study

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### Abstract

Avascular necrosis (AVN) of the hip is a progressive condition that can lead to joint destruction if not treated effectively. Core decompression is a standard intervention for early-stage AVN, and the addition of a fibula graft may enhance structural support and promote healing. This prospective study evaluates the clinical and radiological outcomes of combining core decompression with fibula grafting in patients with Grade 2 AVN of the hip. Over a two-year follow-up period, we assess pain relief, functional improvement, and radiographic changes.

**Keywords:** Avascular necrosis, hip, core decompression, fibula graft, Grade 2 AVN, bone healing, hip preservation.

### Introduction

Avascular necrosis (AVN) of the hip, particularly in its early stages, presents a significant therapeutic challenge. Core decompression is widely used to alleviate intraosseous pressure and enhance revascularization in early-stage AVN. The addition of a fibula graft aims to provide mechanical support and facilitate bone healing. This study investigates the outcomes of core decompression with fibula grafting in patients with Grade 2 AVN of the hip.

### Methods

#### 1. Study Design

- Prospective cohort study.
- **Inclusion criteria:** Patients diagnosed with Grade 2 AVN of the hip based on the Ficat and Arlet classification.
- **Exclusion criteria:** Patients with Grade 1 or Grade 3 AVN, previous hip surgeries, or systemic conditions affecting bone health.

#### 2. Participants

- Thirty patients (35 hips) diagnosed with Grade 2 AVN.
- Informed consent obtained from all participants.

#### 3. Surgical Procedure

- Core decompression performed through a standard lateral approach.
- A fibula graft was harvested from the ipsilateral leg and inserted into the decompression tract.
- Postoperative care included restricted weight-bearing for six weeks, followed by gradual return to full weight-bearing as tolerated.

#### 4. Outcome Measures

- **Pain Assessment:** Visual Analog Scale (VAS) for pain preoperatively and at 6, 12, and 24 months postoperatively.
- **Functional Outcome:** Harris Hip Score (HHS) to evaluate hip function and patient mobility.

- **Radiographic Evaluation:** MRI and X-rays to assess femoral head integrity, graft incorporation, and progression of AVN.

## Results

### 1. Pain Relief

- Significant reduction in VAS pain scores from a mean of 7.5 preoperatively to 2.3 at 24 months ( $p < 0.01$ ).

### 2. Functional Improvement

- Mean HHS improved from 52 preoperatively to 88 at 24 months ( $p < 0.01$ ), indicating substantial improvement in hip function and patient mobility.

### 3. Radiographic Outcomes

- MRI and X-ray assessments showed no progression to Grade 3 AVN in 90% of hips.
- Evidence of fibula graft incorporation and new bone formation in the majority of cases.

### 4. Complications

- Minor complications included donor site pain in three patients, which resolved within three months. Another two reported subcutaneous infection at the donor site which resolved with longer antibiotic treatment.
- No major complications or graft failures reported.

## Discussion

The combination of core decompression with fibula grafting in Grade 2 AVN of the hip demonstrates significant pain relief, functional improvement, and favorable radiographic outcomes over a two-year follow-up. The fibula graft provides mechanical support and facilitates bone healing, potentially delaying or preventing the progression to more advanced stages of AVN. Further studies with larger sample sizes and longer follow-up periods are warranted to confirm these findings.

## Conclusion

Core decompression with fibula graft addition is an effective treatment for Grade 2 AVN of the hip, offering substantial benefits in terms of pain relief, functional improvement, and preservation of femoral head integrity. This technique should be considered in the early management of AVN to improve patient outcomes and delay the need for more invasive procedures.

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