

Genicular Artery Embolization for the Treatment of Symptomatic Knee-OA: A Comprehensive Analysis of 167 Patients

PURPOSE

Genicular artery embolization (GAE) is an innovative minimally invasive therapy for patients with symptomatic knee osteoarthritis (OA) refractory to conservative treatments, aiming to reduce synovial arterial hypervascularity. This study evaluates the safety and efficacy of GAE for the treatment of symptomatic knee OA.

METHODS AND MATERIALS

A retrospective, single-center study was conducted at our institution. Patients enrolled in the study were aged 40 to 90 years, had moderate to severe knee OA (Kellgren-Lawrence grade 2 to 4), and had previously experienced failure of conservative therapy. Baseline pain (assessed using the visual analog scale [VAS]) and symptom scores (Knee Injury and Osteoarthritis Outcome Score [KOOS]) were evaluated. After achieving femoral arterial access via a 4 Fr sheath, embolization was performed using Imipenem/Cilastatin. Target vessels were determined using digital subtraction angiography in correlation with the patients' pain points. Adverse events and symptom scores were assessed at six weeks, three months, and six months after GAE.

RESULTS

167 patients with a total of 246 treatments were enrolled, with a median age of 69 years (IQR, 61, 74). Knee OA severity was grade 2 in 12% of cases, grade 3 in 41%, and grade 4 in 47%. Technical success was achieved in 100% of procedures. Transient skin discoloration and transient mild knee pain after the procedure were noted in 18% of all cases, as expected. No severe complications were reported. The KOOS quality of life index and VAS improved by 87% and 71%, respectively, at six months from a median baseline of 57 (of 100) and 7 (of 10), respectively.

CONCLUSIONS

This retrospective study in a large patient cohort demonstrates that GAE is an effective and safe treatment for reducing OA-associated symptoms that are refractory to conservative therapy.

CLINICAL RELEVANCE/APPLICATIONS

The development of this novel, minimally invasive technique allows interventional radiology communities worldwide to treat chronic joint disorders more efficiently. However, comprehensive and standardized data from large-scale studies remain limited. This study aims to provide a thorough analysis to support the standardization of GAE as a routine treatment for knee-OA.