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Direct sinus exposure and Transvenous Embolization Approach for Treating Dural Arteriovenous Fistula Involving Isolated Sigmoid Sinus: Two Cases Report

Bum Mo KANG, Gi Yong YUN, Jong-Hyun PARK, Jae-Min ANN, Hyuk-Jin OH, Jai-Joon SHIM, Seok Mann YOON

Department of Neurosurgery, Soonchunhyang University Cheonan Hospital, Cheonan, Korea.

Purpose:

Dural arteriovenous fistula (DAVF) is a rare vascular condition affecting about 1.5% of one million individuals annually, often manifesting in the transsigmoid and cavernous sinuses. While isolated sigmoid sinus DAVF is exceedingly rare, its management poses significant challenges. Here, we present two cases of staged intervention for treating isolated sigmoid sinus DAVF. The approach involved a minimally invasive craniectomy to expose the sinus followed by transvenous embolization in a dedicated angio suite.

Methods:

In the operating room, under general anaesthesia, a small craniectomy was performed using neuronavigation system. The sigmoid sinus was exposed within the small craniectomy, and bleeding was controlled using bone wax and fibrinogen/thrombin-based collagen fleece. The patient was then transferred to the angio suite, and a 5-French sheath was placed in the left femoral artery. Using visual surveillance and roadmap guidance, the affecting sigmoid sinus was punctured using micropuncture sheath was sequentially placed under fluoroscopic guidance for performing transvenous embolization

Results:

Case Presentation:

Case 1: A 69-year-old female with asymptomatic Borden type III/Cognard type III DAVF involving an isolated sigmoid sinus underwent a staged procedure. Initially, navigation-guided exposure of the sigmoid sinus was performed in the operating room, followed by transvenous embolization by multiple coils and Onyx in the angio suite.

Case 2: A 35-year-old male with recurrent Borden type III/Cognard type III DAVF involving an isolated sigmoid sinus, who had previously undergone three transarterial embolizations, was treated with a staged approach. The isolated sigmoid sinus was exposed through minimally invasive craniectomy, and subsequent transvenous embolization by multiple coils was performed in the angio suite.

Conclusions:

Managing DAVF poses challenges, with treatment strategies including surgical disconnection, transarterial embolization, transvenous embolization, and stereotactic radiosurgery. However, cases involving isolated sinuses are particularly intricate due to limited surgical accessibility. Our approach, involving direct sinus cannulation and subsequent transvenous embolization, proved to be highly effective in these cases. This staged methodology can offer a successful treatment avenue for such complex DAVF cases involving isolated sigmoid sinuses.