Endovascular Management of peripheral congenital Arteriovenous Malformation and Arteriovenous Fistula in Nepal

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Abstract

Introduction: The management of peripheral arteriovenous malformations (AVMs) and arteriovenous fistula (AVF) remains challenging in Nepal due to their unpredictable behavior and high recurrence rate. Materials and Methods: This report describes cases of peripheral AVM and AVF. We report the case of a 20-year-old male with AVMs draining from a superficial femoral artery (SFA) with multiple feeders on the left lower thigh who underwent embolization of SFA feeders. Other case was a 60-year-old female with very high-flow AV fistula from the inferior gluteal artery with large venous varix of draining vein who underwent coil embolization of nidus followed by glue embolization. Results: Both patients got relieved of pain and significantly decreased mass & pulsation. The outcome was satisfactory without complication. Conclusion: Treatment for peripheral AVM and AVF is a challenge due to their unpredictable behavior. There is a wide plethora of embolic agents, each with its particular characteristics that makes it ideal for certain situations. Familiarity with these and their modes of use and action can help in selecting the correct agent depending on the goal of embolization.

Keywords: Arteriovenous fistula, arteriovenous malformations, embolotherapy

Introduction and Background

A tangle of blood vessels in the peripheral parts bypassing normal tissue and directly diverting blood from the arteries to the veins are called peripheral arteriovenous malformation (AVM). An abnormal communication between an artery and a vein in peripheral parts is called peripheral arteriovenous fistula (AVF). Peripheral AVM and AVF are rare congenital lesions. Complete eradication of the nidus of an AVM is the only potential cure.\(^1\) Surgical resection is often difficult, and recurrence of the AVM is common with incomplete resection. Transcatheter embolization now plays a significant role in the treatment of AVM and AVF.\(^2\) For very large malformations, preoperative embolization may be helpful before surgical intervention due to the increased risk of massive bleeding associated with such anomalies. This report describes cases of peripheral AVM and AVF treated by me at Nepal with my proctor Dr. Virender Singh Sheorain from my fellowship Institute Medanta, India. We report a case of a 20-year-old male with AVMs draining from a superficial femoral artery (SFA) with multiple feeders on his lower thigh who underwent embolization of nidus. The other case was a 60-year-old female with very high-flow AVF from the inferior gluteal artery with large venous varix of draining vein who underwent coil embolization of nidus followed by glue embolization.

Objective

The objective of this study was to assess the treatment results of coils and glue embolization of peripheral AVM and AVF at Nepal.

Materials and Methods

Case of arteriovenous malformations

A 20-year-old male found painful pulsatile nodules on his left lower thigh which was progressively enlarging for several months. Computed tomography (CT)–angiography showed AVMs draining from SFA with multiple feeders on his lower thigh. The patient underwent embolization of nidus of n-butyl cyanoacrylate (NBCA) and lipiodol through right-side CFA approach with 5 fr sheath and progreat microcatheter [Figure 1].

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Case of arteriovenous fistula
A 60-year-old female consists of pain and pulsation in her buttock which has also been progressively enlarging for several years. CT angiography showed very high-flow AV fistula from the inferior gluteal artery with large venous varix of draining vein. She underwent coil embolization of nidus followed by glue embolization through the right femoral approach. It was followed by percutaneous lipiodol injection [Figure 2].

RESULTS
Both patients got relieved of pain and significantly decreased mass n pulsation. The outcome was satisfactory without complication.

DISCUSSIONS
The current management of peripheral AVM and AVF based on the new concept of a multidisciplinary team approach can minimize the morbidity and reduce the recurrence of the lesion. There has recently been further expansion of the limited role of embolotherapy as adjunctive therapy for surgical resection. This approach has even been helpful in high-risk lesions with high-flow status. Numerous embolic materials have been developed, ranging from simple Gelfoam pledges to complex systems employing microcatheter and detachable coils. We chose NBCA coils as the permanent embolic agents. Some use NBCA to temporarily control the bleeding because it cannot act as a permanent agent to control a lesion effectively as there is no evidence of permanent damage to the endothelium. Some use ethylene–vinyl alcohol copolymer (Onyx®, Micro Therapeutics, Irvine, CA, USA) instead of NBCA. Onyx®, unlike other liquid embolic agents does not adhere to the endothelial wall and catheter tip. However, Onyx® is also less adhesive than NBCA; therefore, NBCA is preferred to Onyx® for high-flow lesion.

CONCLUSION
Treatment for peripheral AVM and AVF is a challenge due to their unpredictable behavior. There is a wide plethora of embolic agents, each with its own particular characteristics that makes it ideal for certain situations. Familiarity with these and their modes of use and action can help in selecting the correct agent depending on the goal of embolization. Embolotherapy is essential to manage peripheral AVM and AVF and to improve the results of treatment and reduce the risk of bleeding associated with open resection with limited morbidity and no recurrence.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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