INTRODUCTION

DAVF caused by tear in the inferolateral trunk (ILT) is an uncommon pathology, which mainly involves the cavernous sinus as well as the adjacent draining veins (1–3). We describe a case of DAVF between the ophthalmic vein and the ILT, which is a rare presentation of traumatic DAVF. Selective transvenous coil embolization was performed via the facial vein without neurologic complications.

CASE REPORT

A 31-year-old man was admitted with exophthalmos. He suffered from progressive exophthalmos, bruit and conjunctival chemosis 7 days after head trauma caused by falling down. Cerebral angiography showed a dural arteriovenous fistula (DAVF) draining into the ophthalmic vein caused by tear in the inferolateral trunk, which is a rare presentation of traumatic DAVF. Selective transvenous coil embolization was performed via the facial vein without neurologic complications.
angular vein, to the SOV, a microcatheter (preshaped J Excelsior, Stryker, Fremont, CA, USA) could be navigated up to the far distal fistulous point under guidance of a 0.014-inch microwire (Synchro, Stryker) and embolization was performed using a single coil (GDC helical 2 × 5 mm, Stryker) (Fig. 1C). Immediately after the procedure, angiography confirmed that the fistula was completely occluded (Fig. 1D).

After the procedure, his ocular symptoms improved without any neurologic complications and he was discharged well. The patient had no recurrent symptoms at the 12-month follow-up.

Fig. 1. A dural arteriovenous fistula of the ophthalmic vein caused by traumatic injury of the inferolateral trunk in a 31-year-old male who presented with exophthalmos.
A. The right ICA angiography showed a fistulous point between the right ILT and confluence of right ophthalmic veins.
B. The right ECA angiography showed a dural arteriovenous fistula with multiple dural feeders from the right MMA, artery of foramen rotundum of the internal maxillary artery, which formed a common fistulous point draining directly into the confluence of right opthalmic veins.
C. Through the right facial vein and the SOV, a microcatheter was navigated distal to the fistulous point and embolization was performed using a detachable coil (2 × 5 mm).
D. The right ICA angiography performed immediately after procedure showed complete obliteration of the dural arteriovenous fistula between the opthalmic vein and the inferolateral trunk.
ECA = external carotid artery, ICA = internal carotid artery, MMA = middle meningeal artery, SOV = superior ophthalmic vein
A Traumatic Dural Arteriovenous Fistula between the Inferolateral Trunk and the Ophthalmic Vein

DISCUSSION

DAVFs associated with the ILT have been rarely reported in the literatures (1-3). Duncan and Fourie (1) reported a case of traumatic DAVF between the cavernous sinus and the ILT and its management with transarterial embolization. Uchiyama et al. (2) described a spontaneous DAVF fed by the ILT and draining into the superficial sylvian vein with varix formation, which was treated by surgical clipping. Interestingly, the case presented in this report showed a rare type of DAVF fed by the ILT, MMA, and IMA forming a common fistulous tract, draining directly into the confluence of ophthalmic veins (Fig. 2) is be fi-without cavernous sinus involvement, but with symptoms mimicking carotid cavernous fistula. Horie et al. (3) also reported a similar case, which was treated by transarterial embolization via the ILT.

In some anatomical reports (4), the ILT was identified in 80% of cadaveric studies, and it arose directly from the cavernous part of the ICA in 84% of studies and from the meningo-hypophyseal trunk in 6% of studies. ILT gives off branches that run to the superior orbital fissure, foramen rotundum, foramen ovale, and foramen spinosum, where they anastomose with branches of the IMA, the MMA and the accessory meningeal artery. Any of these branches can be injured and may be connected to venous structures outside the cavernous sinus after head trauma (2, 5). The anterior ramus of the ILT divides into medial and lateral branches: the former supplies the third, fourth, and fifth cranial nerves and ends as the deep recurrent ophthalmic artery, which interrelates with some branches of the IMA; the latter supplies the dura of the adjacent temporal fossa and the nerve, and it anastomoses with the artery of the foramen rotundum. Unique hemodynamics in this case could be explained by the anatomical proximity of the ILT to the SOV, adjacent narrowing of the transitional zone from the ophthalmic confluence to the cavernous sinus, and topographical complexity of the superior orbital fissure (3, 6).

Endovascular treatment has become the first treatment option for DAVF because it can offer similar results with use of a less invasive approach, while direct vascular surgery or indirect packing may be performed only if the endovascular option fails (2, 5). In this case, we preferred the transvenous approach via the facial vein to transarterial embolization via the ILT, MMA, or IMA due to the possible risk of cranial nerve damage from embolic complications. Some authors (1) reported catheterization failure in the ILT via the transarterial approach and development of neurologic complications following transarterial glue embolization via the MMA or ILT. Kiyosue et al. (7) also described the potential risk of ophthalmic nerve injury following embolization of the distal branches of the IMA.

For transvenous embolization of paracavernous DAVFs, Kim et al. (8) remarked that the facial vein is likely to be a safe and effective route, and our case was also treated successfully through the same route. Caragine et al. (9) described transvenous embolization of DAVFs of the ophthalmic vein fed by the ophthalmic artery and the IMA or the MMA without any neurological deficit.

In conclusion, a DAVF between the ILT and the ophthalmic vein without direct involvement of the cavernous sinus caused by traumatic injury of the ILT is a rare pathology, and it was successfully treated with transvenous coil embolization.

REFERENCES

1. Duncan IC, Fourie PA. Type D traumatic carotido-cavernos-

아래가족동맥 외상성 손상에 의한 눈정맥의 경질막동정맥루: 얼굴정맥을 통한 경정맥 코일 색전술 사례

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31세 남자가 안구떨출증으로 입원하였다. 환자는 7일 전 추락 사고로 인한 두부 외상 후 점차 심해지는 안구떨출, 잡음, 결막부종을 호소하였다. 뇌혈관조영술에서 아래외측동맥의 손상에 의해 발생한 경질막동정맥루가 발견되었고, 이것은 외상성 경질막동정맥루 중에서 드문 경우이다. 얼굴정맥을 통한 선택적 경정맥 코일 색전술이 신경학적 합병증 없이 시행되었다.

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