CIRCONSCRIPT SUBCUTANEOUS ARTERIOVENOUS MALFORMATION OF THE HEAD

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SUMMARY

The aim of this study is to show the various possibilities to treat this rare malformation, accentuating the results of the early surgical treatment before complications.

Material: The authors present 8 cases of patients with subcutaneous arteriovenous malformations, 5 females and 3 males (age of 7, 13, 19, 23, 27, 52 and 58 years) treated in the period of 1999 until 2015 at the Clinic for Neurosurgery and the Clinic for Plastic, Aesthetic and Reconstructive Surgery in Skopje, Republic of Macedonia. This malformation has been observed by the parents in the childhood, around the age of 3 years in all cases. Local red circumscribed nodule, soft, with manually discharging tendency and varicose dilated veins have been observed in all cases, deaf on both sides in one case, while in the older case, a cavernous sinus thrombosis caused unilateral exophthalmia, hyaline indurated ophthalmic vein, vertigo, arrhythmia, heart failure and bradypsychia have been observed. The size of the malformation has been from 2.5 to 7 cm. The diagnostics was done using CT, CT-angiography and digital angiography including external carotid angiography. Endocranial arterials peduncle was present in all cases.

Results: Six cases underwent surgery, while two cases were treated with several treatments of endovascular embolization. The follow up has been ranged from 2 to 15 years. All surgically treated patients improved without recurrence, the exophthalmia, bradypsychia and the heart problems regressed, while in patients treated with endovascular non-complete occlusion the AVM decreased, but still remained.

In conclusion: The Surgical treatment remains a first option if it is possible, and as earlier as possible, while embolization is a useful tool in cases where a complete excision is not possible.

Key words: Subcutaneous AVM, surgery

INTRODUCTION

Subcutaneous arteriovenous malformations are known as angioma arteriovenosum cirsoide or aneurisma arteriovenosum cirsoide in the literature. They often appear in the subcutaneous tissue of the head and the face, rarely elsewhere on the human body. Although there are some indications in the literature for the traumatic cause whether, at birth or soon after birth, an error in the development of the blood vessels in the normal embryonic arteriovenous seals of the primitive bloodstream is rather adopted.

Therefore at that place appears a constant entry of arterial blood in the veins, which makes them dilated, soar and tortuous due to the increased pressure. The increased blood pressure in the veins causes reactive flourishing of the tissue in the walls of the venous junctions and therefore, they become increased and thicker.
**CLINICAL MATERIAL**

In the period of 15 year from 1999 to 2015 at the Clinic for Neurosurgery and the Clinic for Plastic, Cosmetic and Reconstructive Surgery in Skopje, Republic of Macedonia we observed and treated eight patients with subcutaneous arteriovenous malformations, five females and 3 males with different ages (...7, 13, 19, 23, 27, 52 and 58 years…) average 28.5 years, median 25 years.

The malformation is noticed in the parents in the childhood (about the 3rd year after birth), but due to insufficient knowledge of the pathology and the insufficient diagnostics the medical treatment has been delayed.

The clinical picture in all patients manifested local red circumscribed island on the skin of the frontal, parietal or temporal area of the skull, soft on palpation with the tendency to diminish the volume under pressure, dilated varicose vein of the scalp and systolic noise on auscultation over the swelling. The two youngest patients have a pulsatile swelling of one temporal region, one with loss of audition because of extension to the pyramidal bone. The oldest patient has exophthalmia due to cavernous sinus thrombosis and consecutive purulent conjunctivitis, ptose, hyaline changed dilated varicose veins, arrhythmias, cardiac problems arising from chronic cardiomyopathy and bradypsychia. The size of the arteriovenous malformation appears from 2.5 to 7 cm in diameter, all with endocranial feeders.

**DIAGNOSIS**

The diagnosis is set up with clinical examination, computed tomography, magnetic resonance imaging of the brain, CT-angiography and digital pan angiography, showing external carotid arteries of both sides.

**TREATMENT**

The arteriovenous malformation has been excised in 6 patients, while two patients have been partially treated in the Acibadem hospital with partial endovascular embolization. The oldest patient with exophthalmia has been firstly treated with adequate antibiotic therapy after antibiogram and after the remission of the infection the malformation has been excised.

**RESULTS**

The revascularization of the malformation in surgically treated patients is not observed. An excellent aesthetic results and complete disappearance of the varicose veins is observed in five cases. Varicose veins regressed in the oldest patient treated surgically, the exophthalmia was withdrawn, the mesh completely open, and remained only a small soft tissue in...
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The early recognition and treatment of circonscript subcutaneous arteriovenous malformations of the scalp is of great importance because of the excellent results. A complete angiographic study of the head is mandatory before the treatment. The surgical treatment represents the first option in the medical treatment of these malformations. It is usually feasible when the nidus of the malformation is small and easily accessible for excision. In older age when the varicose developed veins of the scalp may cover the malformation, or when other associated complications may appear changing the surrounding skin, the modern medicine employs the methods of endovascular embolization. However, the endovascular treatment is rarely complete and may lead to incomplete occlusion of the malformation because of the many anastomoses of the blood vessels of the skin. Apart from that, the endovascular treatment may lead the hair disorder in a certain part of the head causing an unpleasant aesthetic effect. Therefore, a combined surgical treatment with surgical excision of the nidus or ligature of certain arteries or branches of the artery that feed the malformation may be employed. The early recognition and treatment of circonscript subcutaneous arteriovenous malformations of the scalp is of great importance because of the excellent results. A complete angiographic study of the head is mandatory before the treatment. The surgical treatment represents the first option in the medical treatment of these malformations, if possible, and should be realized as earlier as possible. The endovascular treatment may be applied as an additional method in the medical treatment, independent or combined with the operational treatment.

DISCUSSION

The malformation is not easy to identify because it is not a frequent one; sometimes it could remain unknown to the specialists in plastic, aesthetic and reconstructive surgery. In the literature there are few published papers on treatment of the subcutaneous arteriovenous malformations of the scalp. According to the published papers, the surgical excision remains radical manner for treatment of these malformations. It is usually feasible when the nidus of the malformation is small and easily accessible for excision. In older age when the varicose developed veins of the scalp may cover the malformation, or when other associated complications may appear changing the surrounding skin, the modern medicine employs the methods of endovascular embolization. However, the endovascular treatment is rarely complete and may lead to incomplete occlusion of the malformation because of the many anastomoses of the blood vessels of the skin. Apart from that, the endovascular treatment may lead the hair disorder in a certain part of the head causing an unpleasant aesthetic effect. Therefore, a combined surgical treatment with surgical excision of the nidus or ligature of certain arteries or branches of the artery that feed the malformation may be employed.

BIBLIOGRAPHY


Цирконскрипти поткожни артеривеновски малформации на главата

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Апстракт

Целта на овој труд е да се прикажат различните можности за третман на овие ретки малформации, ставајќи акцент на раниот третман, додека не настанат големи компликации.

Материјал: Авторите прикажуваат 8 случаи на поткожни артеривеновски малформации, 5 женски и 3 манички (возраст 7, 13, 18, 19, 23, 27, 52 и 58 години) лекувани во периодот од 1999 до 2015 година на Клиниката за неврохирургија и на Клиниката за пластична, естетска и реконструктивна хирургија во Скопје, Република Македонија. Малформацијата кaj пациентите била забележана од родителите во детска возраст (од три години). Болеста се манифестирала со локален црвен цирконскриптен оток на кожата на поглавината, мек на палпација, со тенденција на празнење на притисок до варикозно дилатирани вени кaj всички четири случаи, глувост на двете уши кaj една пациентка, додека кaj површината на личност и со егзофталмус поради додатна тромбоza на sinus cavernosus, хиалино променети дилатирани вени, артритми, срцеви проблеми што произлегуваат од хроничното преоптоварување на срцето и брадипсихија. Дијаметарот на малформацијата од 2,5 до 7 cm е неправилен. Дијагнозата е поставена со КТ-скен, КТ-ангиографија и вклучувајќи и a. carotis externa. Сите случаи имале ендокранијални артериски педункули, кои ја хранеле малформацијата.

Резултат: Третманот кaj 6 случаи е изведен оперативно, со ексцизија на малформација, додека кaj двата случаи емболизирана. Постоперативното следење на пациентите изнесува од 3 до 15 години, кaj оперативно лекувани пациенти нема рецидиви, додека кaj пациентки лекувана со емболизација ја упуштено васкуларна малформација.

Заклучок: Хируршкиот третман претставува прва опција во лекувањето на овие малформации, доколку е можен и што е можно порано, додека емболизацијата може да се применi како дополнителна метода во лекувањето.

Kew words: поткожен AVM, операција