

Carotid–Cavernous Sinus Fistula as a Complication of Embolectomy Using a Fogarty Catheter

Neurosurg. Rev. 4 (1981) 191-192

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The use of a Fogarty catheter for embolectomy may damage the carotid artery. The vascular lesion may go on to a subsequent arterio–venous fistula. This possible complication will be illustrated by our case history.

Case history

A 27-year-old patient was admitted to the hospital, suffering from a left-sided hemiparesis following a complete blockage of the right internal carotid artery. An embolectomy was done using a Fogarty catheter and a 3 cm embolus was removed from above the bifurcation. The hemiparesis disappeared completely. During the first few weeks after operation a definite exophthalmos developed on the right side. It was interpreted as a cavernous sinus thrombosis.

Five months later the patient came to our neurosurgical outpatient clinic. He complained of a noise in the right fronto–temporal region synchronous with his pulse. A marked exophthalmos was evident and also double vision. Visual acuity was reduced to finger-counting. The peri-orbital area was swollen and doughy and of a livid blue colour. There was distinct chemosis and painful paraesthesiae in the distribution of the first division of the trigeminal nerve.

A right carotid angiogram including compressing the opposite side showed the carotid–cavernous sinus fistula. A definite cross-circulation of the contrast medium to the left by the anterior communicating artery was noted.

Various operative procedures are described by Grunert (6), Parkinson (11) and Isfort (8). The results are not always satisfactory (9, 12). Nowadays the balloon–catheter–technique described by Debrun et al. (3) is the most proven procedure. Among various methods we first chose ligation of the right common carotid artery. Because of the previous occlusion of

the internal carotid we thought it necessary to carry out, as carefully as possible, a ligation of both carotid branches in order to eliminate the fistula. Indeed, a reappearance of the left-sided hemiparesis could be prevented by this procedure.

We therefore consciously avoided the balloon–catheter method in the first place. Postoperatively the pulse–synchronous noise, exophthalmos and chemosis disappeared and the movements of the eyeball increased.

Six weeks after ligation a bilateral catheter angiography was carried out and showed no evidence of a refilling of the old fistula by collateral blood flow. In view of this good clinical improvement we abandoned the idea of an additional ligation of the internal carotid artery. During the following 1½ years no neurological deficits, neuropsychological defect symptoms or convulsive disorders developed.

The CT scan showed the dilated ophthalmic vein and the thrombosed cavernous area as a hyperdense zone. A hypodense polycystic area in the right hemisphere can be interpreted as infarction due to the first blockage of the internal carotid.

Discussion

Carotid–cavernous sinus fistula is a rare complication after embolectomy with Fogarty catheter. It remained unrecognized for a long time. Partly irreversible symptoms could not be prevented.

So far only seven cases of cavernous sinus fistula after advancement of a Fogarty catheter have been described. Corresponding descriptions were given by Barker et al. (1), Wagner et al. (13) and Eggers et al. (5). Apart from a cavernous sinus fistula other complications of embolectomy are reported by Bryant (2) and Dunsker (4). The increasing usage of the Fogarty catheter carries the danger of iatrogenic damage to the vessel wall. The individual anatomical

variations of the carotid siphon can make the advancement of the catheter difficult. The passing of the skull base can remain unnoticed and result in the lesion of a vessel in the area of internal carotid artery.

Even indirect manipulation of the proximal part of the carotid artery can cause a vascular lesion or

rupture of small arterial branches. The importance of the symptoms of the affected eye or irreversible neurological deficits are underlined by Hamby (7), Krayenbühl and Yasargil (10), Walter and Bischoff (14). In order to avoid irreversible damage a cavernous sinus fistula after embolectomy by Fogarty catheter must be considered.

Summary

A case is described showing the complications of a carotid-cavernous sinus fistula after using a Fogarty catheter for embolectomy of the carotid artery. The main symptoms are evidence of pulse-synchronous head noises, exophthalmos, visual disturbances and disorders of eye movement. After embolectomy follow-up examinations of the patient over a long period are required. In case of suspicious signs diagnostic procedures should be done as soon as possible and operation must be done if indicated, otherwise irreversible cerebral malfunction, loss of vision and severe facial disfigurement threatens the patient.

Key words:

Carotid-cavernous sinus fistula – Complications of embolectomy – Fogarty catheter

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Zusammenfassung

Anhand einer Falldarstellung wird auf die Komplikation einer Carotis-Sinus cavernosus-Fistel nach Verwendung eines Fogarty-Katheters bei der Embolektomie der Carotis interna hingewiesen. Angaben über pulssynchrone Kopfgeräusche, Exophthalmus, Visusstörungen und Bulbusmotilitätsstörungen gelten als mögliche Hinweise auf diese folgenschwere Komplikation. Grundsätzlich sollte nach erfolgter Embolektomie im Carotis interna-Bereich insbesondere unter Berücksichtigung der hier beschriebenen Komplikation auf regelmäßige und langfristige Nachuntersuchung geachtet werden, um irreversible zerebrale Funktionsstörungen, Visusverlust und schwere Gesichtsentstellungen zu vermeiden.

Schlüsselwörter:

Carotis-Sinus cavernosus – Fistel – Komplikationen bei Embolektomie – Fogarty-Katheter

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