Air gun pellet embolizing the intracranial internal carotid artery

Case report

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A rare case of a pellet embolus to the internal carotid artery is reported, and similar cases are briefly reviewed.

KEY WORDS • air gun pellet • embolus • carotid siphon

TRAUMATIC embolization of the cerebral circulation is an extremely rare occurrence. This is the first recorded case of a pellet lodged within the intracranial internal carotid artery.

Case Report

A 56-year-old man was admitted after being shot in the neck with a 5-mm air rifle. Examination. There was a small wound of entrance to the left of the hypopharynx, but no wound of exit could be found. Pharyngoscopy disclosed blood within the hypopharynx and it was assumed that the pellet had traversed this structure. Cervical spine films on the day of admission showed the pellet lodged within the soft tissues of the neck just to the right of the vertebral body of C-5. Three days later a repeat cervical spine film showed it had not moved (Fig. 1).

Operation. At surgery 12 days after injury, the pellet could not be found but a small hole was noted in the wall of the right common carotid artery. Skull films showed the pellet was lodged within the skull just below the clinoid process on the right side.

Postoperative Course. The patient was neurologically intact. Subsequently, a right retrograde brachial arteriogram showed excellent filling of the right common carotid artery but the right internal carotid artery was only faintly seen (Fig. 2). Antegrade filling of the vertebral artery, the basilar artery, and the posterior cerebral artery was also noted. There was also excellent retrograde filling of the intracranial internal carotid artery by way of the posterior communicating artery to the level of the pellet, but not beyond. A right common carotid arteriogram showed symmetrical tapering of the dye column for a distance of 2½ cm distal to the bifurcation of the common carotid artery. At this point the internal carotid artery was completely occluded by the pellet, impacted where the internal carotid artery pierces the dura (Fig. 3). A stagnant column of blood between the impacted pellet and the bifurcation of the common carotid artery had partially thrombosed. It was decided that the pellet was inaccessible and could not be removed.

The patient continued to complain of fairly severe right frontal headaches for several months but these gradually subsided. The
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headaches were probably secondary to dilatation of the collateral vascular net. The patient has remained neurologically intact for 16 months.

**Discussion**

Metallic fragments within the arterial system have been described on numerous occasions, but intracranial embolization has rarely been reported. Kapp, *et al.*, reported four patients with metallic fragments from combat wounds embolizing to the middle cerebral artery. These were successfully removed through arteriotomy. Van Gilder and Coxe successfully removed a No. 2 shotgun pellet that had embolized to the middle cerebral artery with perforation of the common carotid artery. The inaccessible location of the pellet in our case precluded its surgical removal. Suzuki, *et al.*, reported the successful removal of a needle within the carotid artery by means of a powerful platinum cobalt magnet; however, the pellet in our patient was nonferrous metal and this method of removal was obviously not applicable.

Erosion of the vessel wall by the pellet was not likely in our patient since the pellet was composed largely of lead which is fairly well tolerated by the blood vessel wall. The pellet

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**Fig. 1.** Cervical spine film showing the pellet near the body of C-4.

**Fig. 2.** Retrograde brachial arteriogram showing good filling of the basilar artery, the posterior communicating artery, and the internal carotid artery distal to the pellet. No retrograde filling of the internal carotid artery is possible beyond the impacted pellet.

**Fig. 3.** Carotid arteriogram showing a gradual tapering of the dye column in the internal carotid artery with a final complete occlusion near the odontoid process.
had been embedded within this patient’s body for 12 days prior to embolization without having caused an infection and was therefore considered sterile. The possibility of removing the pellet by means of a Fogarty catheter was suggested by our vascular surgical colleagues but the pellet was so tightly impacted within the internal carotid artery that such a catheter could not have been negotiated past the pellet even if it could have traversed the curve of the intrapetrous carotid artery. Thus, all avenues of approach to this embolus were blocked to us. The long-range future of this patient obviously depends on his collateral vascular net.

References


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