Traumatic Occlusion of the Carotid Artery*

Case Report

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Occlusion of the carotid artery with both closed and penetrating wounds of the neck is well documented. The following case of a penetrating wound of the neck resulting in thrombosis of the carotid artery is believed to be unusual, and to the author’s knowledge a similar case has not been described.3–6

Case Report

A 60-year-old merchant was transferred from another hospital to the otolaryngology service of the Barnes Hospital on February 25, 1967. About 7 hours before transfer, the patient had been shot in the neck by a thief. The gun had been held approximately 1 foot from the patient’s neck; the missile was a .22 caliber bullet. He did not lose consciousness but noted hoarseness immediately. No initial neurological deficit was noted.

Examination. The patient was mildly confused. There was moderate swelling of the neck, but the skin was not tense and the soft tissues were slack. The wound of entrance was in the right posterior cervical region; the wound of exit was in the neck anteriorly at the level of the angle of the jaw. Blood pressure was 130/80, pulse 80 and regular, and the temperature normal. The patient was hoarse, and examination of his larynx showed that the right vocal cord was paralyzed. Otherwise, the general physical examination was not remarkable.

The patient had a left hemiparesis which was most marked in the arm, with posturing of his left hand and a feeble grip. There was hypesthesia and hypalgesia of the entire left side, with extinction on the left when presented with simultaneous bilateral touch stimuli. The patient was thought to have a left homonymous hemianopsia, but this was difficult to assess because of his poor cooperation. A right brachial angiogram showed total occlusion of the right common carotid artery (Fig. 1 left).

Operation. Angiography was followed immediately by surgery. Virtually no free blood was found in the neck; there were only a few fragments (3 to 5 mm each) of old clot. When the common carotid artery and its internal and external branches had been mobilized, we found, to our surprise, one hole in the anterior wall of the common carotid artery and another posteriorly. The vessel had been completely penetrated by the missile. The lacerations, which measured 5 to 6 mm, were located just below the level of the carotid bifurcation and sealed by an intramural thrombus. Palpation of the artery indicated that the thrombus extended approximately 1 to 1 1/2 cm below the bifurcation and for approximately the same distance above it (Fig. 2). The vagus nerve was frayed, but intact. The artery was laid open by cutting across the island of vessel wall which connected the two lacerations anterolaterally, and the thrombus removed. Mild atherosclerotic changes in the intima were present. There was good backflow from the internal carotid artery, but run-off from the external was feeble. The artery was repaired with 7-0 silk. Upon reestablishment of the circulation, there was a good pulse in the internal carotid artery; that of the external was weak.

Postoperative Course. The patient showed progressive improvement. Ophthalmodynamometry showed the pressure to be equal in both eyes. The wound healed uneventfully. On March 8, approximately 2 weeks postoperatively, a right brachial angiogram was repeated. This showed reestablishment of the circulation with good filling of the common

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and internal carotid arteries. The external carotid failed to fill (Fig. 1 right).

On March 11, the patient had a minor staring spell with the eyes deviating to the left. On March 15, he had another similar episode accompanied by focal twitching of the left arm and face. Both episodes lasted only a few seconds, and there was no residual. The patient was placed on Dilantin, 100 mg per day. He had no further seizures and was discharged on March 17.

At the time of discharge his gait was normal. The grips were equally strong, but he had mild drift in his left arm and moderate astereognosis in the left hand. His visual fields were normal. At check-up 1 month after discharge, the neurological examination was entirely normal save for mild astereognosis in the left hand. The patient’s voice was stronger, but he was still hoarse.

Discussion

The unique feature of this case was the absence of free blood in the neck. In penetrating wounds of the carotid artery, hemorrhage is always reported, frequently resulting in shock and respiratory obstruction. In all probability, immediate spasm of the traumatized vessel wall accounted for the findings in this case. Evidence for spasm of the carotid artery in penetrating neck wounds has been presented by Ecker1 and is well documented in arterial injuries in the extremities.5 This physiological response (spasm) and the fact that the patient

![Fig. 1. Left: Preoperative right brachial angiogram showing occlusion of right common carotid artery. Contrast medium did not pass beyond level of arrow. Subsequent serial views of the head showed collateral circulation to the right side from the left carotid, the proximal portion of which can be seen here. Right: Postoperative right brachial angiogram showing reestablishment of the circulation of the right common carotid artery with good filling of the internal. The external carotid did not fill.](image-url)
had a good collateral circulation were the decisive factors in preventing the dire complications (shock, respiratory obstruction, hemiplegia) which accompany such injuries.

Summary
We have described a case of occlusion of the common carotid artery resulting from a penetrating neck wound in which the vessel was pierced through and through by a .22 caliber missile. The holes in the vessel wall had been sealed by the formation of an intramural thrombus which also occluded the vessel and produced a hemiparesis. Removal of the thrombus and repair of the vessel wall resulted in reestablishment of the circulation and was attended by recovery of neurological function.

References

Fig. 2. Diagram of path of bullet through the carotid artery from posterior to anterior (arrow). Cross-hatched area indicates extent of intramural thrombus which sealed the laceration.