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Angiography in Penetrating Neck Injuries

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Angiography in Penetrating Neck Injuries

A paper by North and his colleagues in this issue [1] concerns emergency angiography in penetrating injuries of the neck and face. The information contained in that article should be carefully studied by radiologists who work in hospitals with large trauma services. Of particular interest are the 78 patients in whom emergency angiography was performed when there were no other physical or neurologic findings or symptoms, except for minor soft-tissue swelling at the wound-entry site. Seventy-six of those patients had normal angiography. In only one patient was there a significant finding—a vertebral artery occlusion—and in that case it did not affect the patient's treatment. The basic question is, therefore, whether angiography is justified under these circumstances, given the apparent low rate of positive findings and the inherent risks of carotid and vertebral arteriography.

Recommendations for routinely exploring all penetrating neck injuries that result from stab or gunshot wounds have been published in the surgical literature [2]. The object of these explorations was to directly visualize and repair, when necessary, those important structures that might have been damaged as a result of the injury. Contrary to this was the more conservative approach by Rao et al. [3]. Because these investigators believed that there would be a high probability of negative explorations if surgery were done in the absence of physical findings, they concluded that mandatory exploration was not required. In order to identify significant vascular injuries while avoiding unnecessary explorations, others have recommended routine angiography [4] so that patients requiring surgery for vascular injuries could be distinguished from patients who could simply be observed. This approach seemed sensible and in many trauma centers routine angiography became part of the standard protocol used in evaluating penetrating neck injuries.

Experience at our medical center with extremity injuries indicated that routine angiography was fruitful and directly affected patient management when there was a hematoma,

active bleeding from the wound, absent pulses, a bruit/thrill, or neurologic findings [5]. When there were no significant findings, peripheral angiography was unrewarding. We believe that the same observations pertain to mid-neck injuries. After the receipt of North's paper, the chiefs of neuroradiology sections in eight hospitals that have large trauma services were contacted to see if North's and our experiences were shared by others. Specifically, the information sought was the procedure used when the surgeon ordered angiography for mid-neck injuries when there were no significant findings. These conversations indicated that although emergency angiography was done in such cases, the studies were uniformly negative. No one was able to recall a single positive case. It is of considerable interest that, as a result of North's data, surgeons at that hospital are now willing to carefully observe and monitor these patients rather than ordering routine angiography (H. Segall, personal communication).

Before confronting a surgeon in this potentially controversial area, the radiologist must be aware of how most surgeons view these injuries. It is commonplace to divide neck and face into three zones [6]: zone 1—below the cricoid cartilage; zone 2—between the cricoid cartilage and the mandible; zone 3—above the mandible. Because the clinical consequences of penetrating injuries to zone 1 (at or near the thoracic inlet) and zone 3 (high cervical area) may be occult and therefore difficult to monitor, angiography is usually advisable in these cases. When a proximity injury in those zones has caused a lacerated vessel, a pseudoaneurysm, or a fistula, intervention is usually required. Because zone 2 is more easily monitored, a strong stand for declining arteriography in the face of negative findings can be made for injuries in this area. While one could argue that after a gunshot wound to zone 2, a shock-wave effect could theoretically cause damage to the wall of a distant vessel and result in a subintimal tear, the possibility of that type of injury is extremely remote. Until data are presented to the contrary, the need to do emergency

angiography in zone 2—penetrating injuries with no clinical findings is seriously questioned. Since all these patients are admitted to the hospital for observation, angiography could be performed if clinical signs develop.

To absolutely convince our surgical colleagues of the validity of this approach, a prospective multicenter study with the direct and active participation of each hospital's trauma service is desirable. A large amount of data, accumulated over a relatively short period of time, could then be evaluated. With this information, the interest of these traumatized patients will best be served and unnecessary angiography will be avoided.

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