TECHNICAL NOTE

CT-Guided Percutaneous Lateral Suprazygomatic Approach for Posterior Orbital Wall Biopsy

Orlando Ortiz, M.D., Demir Bastug, M.D.,
and Brian Ellis, M.D.

ABSTRACT—We describe a computed tomography- (CT) guided percutaneous technique for obtaining a core tissue sample from the bony margin of the orbital apex via a lateral suprazygomatic approach. We found this route to be safe and effective while obviating the need for an open biopsy in a patient presenting with a mass encroaching on the left orbital apex. (*Skull Base Surgery*, 6(4):249–251, 1996)

CASE REPORT

A 72-year-old male with a past medical history of prostate cancer presented with progressive deterioration of vision involving the left eye. He noted a complete loss of vision in the left eye over a 3-month period. CT examination revealed a large mass encroaching on the optic nerve within the left orbital apex. This expansile, lytic lesion involved the greater wing of the sphenoid bone and was associated with a moderately enhancing soft-tissue component.

The patient was referred for CT-guided biopsy of the lesion. The patient was placed in the supine position in the CT scanner. The head was stabilized with a head-holder, and the patient was given intravenous sedation and analgesia (25 mg promethazine, 3 mg diazepam, and 25 mcg fentanyl). Contrast-enhanced CT of the orbits was performed utilizing continuous 3-mm thick axial slices at 3-mm intervals to localize the lesion. In addition to showing the enhancing portions of the lesion, the use of contrast outlines all superficial and deep vascular structures that are to be avoided during the biopsy procedure; in particular, the superficial temporal artery. We then placed markers on the left temporal side of the patient's head. The markers consisted of three 18 gauge needles taped 1 inch apart prior to obtaining axial images (Fig. 1A). We chose the marker closest to the lesion and positioned the table above the level of the zygoma. The skin biopsy site was marked with ink prior to sterile prepping and draping.

One percent lidocaine local anesthesia was placed at the skin site. A 22-ga 3.5-inch-long spinal needle was placed initially as a reference mark and to generate a tract. Appropriate positioning of this needle was verified with CT. The spinal needle was then removed and a 14 ga core short needle set was used. This set contains a trochar, a trephine, and a tissue fixator. The trochar was placed in the trephine and passed into the lesion. Resistance was encountered at the temporalis fascia. The trochar was used to puncture a small hole in this fascia utilizing a gentle rotary motion (Fig. 1B); positioning within the bone was verified with CT (Fig. 1C). The trochar was removed, and the tissue fixator was placed in the trephine. A core sample was obtained with a turning motion of the tissue fixator (Fig. 1D). The core sample was removed from the tissue fixator with a stylet. In addition, fine needle samples for cytology were obtained through the trephine. Two core samples and two fine needle aspirations were obtained.

The patient tolerated this procedure well, with no significant discomfort or blood loss. Pathologic analysis of all four specimens revealed metastatic adenocarcinoma of the prostate.

DISCUSSION

Fine needle aspiration techniques have been used for diagnosing orbital lesions. In the standard anterior approach, a needle is passed adjacent to the globe after

Figure 1 A: Contrast-enhanced axial CT image at level of orbits show three needle markers overlying the left temporal scalp. An enhancing soft-tissue mass within the sphenoid bone is associated with bony destruction and encroachment on the orbital apex (arrow). B: Diagram of skull in frontal and lateral views shows position of tissue fixator-trephine relative to zygomatic arch and orbital apex (asterisk). (Figure continued on the next page.)

being introduced through the skin at the edge of the orbit.^{1,2} A major limitation of this technique, however, is that posterior lesions, particularly those in the orbital apex, are difficult to reach. This can result in nondiagnostic procedures.^{3,4} Surgical approaches, including lateral orbitotomy and transcranial supraorbital approach, are often required for these difficult cases.⁵ Our experience with a lateral suprazygomatic percutaneous approach provides another option in the diagnostic evaluation of posterior orbital wall lesions. As with any percutaneous ap-

proach, limitations and possible complications exist. Retro-orbital hemorrhage is a potentially catastrophic complication of this procedure. Therefore, an ophthalmologist should always be available in case emergent orbital surgery is required. Care must be taken to avoid the superficial temporal artery as well as the optic nerve. A major limitation is that of patient cooperation, which may be significantly improved, as in our case, with conscious sedation and stabilization of the patient's head within a head-holder.

Figure 1 (Continued). C: Contrast-enhanced axial orbital CT image shows trephine inserted via supra-zygomatic approach. The distal tip of the trephine abuts the lateral orbital wall as evidenced by the beam hardening artifact at the trephine tip (arrow). D: Axial CT image (bone window) shows trephine in place and tissue fixator within substance of mass.

REFERENCES

1. Shields JA, Shields CL: Biopsy techniques for orbital tumors. *Int Ophthalmol Clin* 33(3):175–180, 1993
2. Westman-Naeser S, Naeser P: Tumours of the orbit diagnosed by fine needle biopsy. *Acta Ophthalmol* 56:969–976, 1978
3. Kennerdell JS, Slamovits TL, Dekker A, Johnson BL: Orbital fine-needle aspiration biopsy. *Am J Ophthalmol* 99(5):547–551, 1985
4. Arora R, Rewar R, Bertharia SM: Fine needle aspiration cytology of orbital and adnexal masses. *Acta Cytol* 36(4):483–491, 1992
5. Maroon JC, Kennerdell JS: Surgical approaches to the orbit. Indications and techniques. *J Neurosurg* 60(6):1226–1235, 1984