Fibrosis surrounding a silicone implant simulating recurrent orbital meningioma

Case report

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A patient with the preoperative diagnosis of recurrent orbital apical meningioma was found to have a fibrotic capsule surrounding a silicone plate implanted 3 years previously to reconstruct the orbital roof. Caution is urged in using alloplastic orbital implants for reconstructive purposes in patients undergoing orbital surgery, because associated fibrous capsule formation may mimic tumor recurrence.

KEY WORDS • orbital meningioma • fibrosis • alloplastic orbital implant • implant

Orbital apex meningiomas are notorious for their recurrence despite all forms of surgical attempts at removal.1,3,8 Recently, we reoperated on a patient with a suspected recurrent meningioma as demonstrated by computerized tomography (CT). Instead of a recurrent tumor, we found a silicone plate, which had been used to repair the orbital roof in a previous craniotomy, and which was now encased in fibrosis. We present this case to alert others to this unusual complication and therapeutic misadventure.

Case Report

This 38-year-old woman developed diplopia, progressive loss of vision, and proptosis in her right eye over a period of 2 years. A CT scan revealed a probable orbital apex meningioma. The tumor was resected with the optic nerve through a transcranial approach. A silicone plate was inserted to cover the orbital roof defect. A CT scan 3 days postoperatively delineated the plate as a hyperdense area in the orbital roof. The patient was followed for 3 years with annual CT scans, the most recent of which revealed a lesion in the anteromedial and posterior aspect of the apex (Fig. 1). The patient was admitted to Allegheny General Hospital, and a repeat CT scan confirmed the suspected lesion.

On physical examination, the pertinent findings were a 4-mm proptosis of the right eye with optic atrophy and complete loss of vision. The right pupil was in midposition and was nonreactive to direct and reflected light. Recurrence of the meningioma was suspected, and it was planned to debulk the tumor before initiating radiation therapy.6,7 A right frontotemporal craniotomy was performed through the previous skin incision. The bone flap was turned. Epidural dissection was difficult because of marked fibrosis between the dura and the orbital roof. The silicone plate inserted at the first operation was identified and was found to be covered with a 2- to 3-mm thick fibrotic capsule. The plate was removed and dissection was continued down to the anterior clinoid region. The dura was opened and the brain was retracted to inspect the optic nerve proximal to the optic canal. There was no evidence of recurrent tumor. The operating microscope and microsurgical techniques were then used to inspect the optic canal, the anteromedial orbital wall, and the orbital apex. There was no evidence of tumor either on inspection, by biopsy, or with digital palpation.

The wound was closed in the usual manner with no repair of the orbital defect. The patient was discharged from the hospital 7 days later with no complications. A subsequent CT scan of the silicone plate, encapsulated
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Fig. 1. Computerized tomography scans taken through the orbit 3 years after tumor removal showing a superior and medial mass lesion.

Fig. 2. Computerized tomography scan of the silicone plate in a saline bath, with the fibrotic capsule dissected from the margins of the plate. Note the same configuration and relative density of the fibrotic tissue to the "tumor" demonstrated in Fig. 1.

by fibrosis, revealed the source of the "pseudotumor" (Fig. 2).

Discussion

Recently, Mauriello, et al.,\textsuperscript{5} presented a series of three patients with unusual late complications caused by alloplastic orbital floor implants for treatment of fractures. All three patients developed unilateral proptosis 13, 16, and 20 years after repair with Teflon implants of orbital blow-out fractures. On later review, the proptosis was thought to be secondary to hemorrhage of capillaries involved in the fibrous capsule that had developed around the implant. The CT appearance of one of these was identical to that in our case. An irregular soft-tissue density surrounded the implant, giving the appearance of an intraorbital tumor. In our case, careful review of the CT scan prior to surgery convinced us that a similar "tumor" had recurred in the anteromedial and posterior aspect of the apex (Fig. 1). This surgical error may have been obviated had coronal views been obtained through the orbit, thus probably demonstrating the entirely superior aspect of the "tumor." In the cases of Mauriello, et al., however, the mistaken diagnosis of a tumor was made despite coronal CT views.

At the time of surgery we found a thickened fibrous capsule completely encapsulating the silicone implant. Although histological examination was not obtained, we believe that the encapsulation in this case was no different from that which is well known to occur at the implantation site of such materials elsewhere in the body and brain.\textsuperscript{2,4}

The primary purpose of this report is to alert surgeons in various disciplines, in particular ophthalmic, otolaryngological, and neurological surgeons, that fibrosis surrounding alloplastic implants may begin as soon as 3 months after implantation, and that the CT appearance of this fibrosis may simulate a tumor. This appears to be the second report of such a finding and the first simulation of a recurrent orbital tumor by an orbital roof implant. In our case, surgery may have been avoided had this been appreciated. In the cases presented by Mauriello, et al.,\textsuperscript{5} all patients underwent surgery because of a mass effect secondary to the implanted material. Caution is urged in using such material near the orbit, particularly in patients who may have neoplastic processes and in whom subsequent surgery may be required.

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Post-implant fibrosis simulating orbital meningioma

References


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