ABSTRACT

Objectives: To report the results of a multidisciplinary approach to silent sinus syndrome, a rare entity with both ophthalmologic and rhinologic manifestations.

Methods: The records of all patients with silent sinus syndrome treated at a tertiary medical center in the last three years were reviewed. Inclusion required imaging demonstrating maxillary sinus atelectasis and orbital floor resorption. Data collected included age, gender, findings during endoscopic sinus surgery, measurement of eyelid and globe position, and presence of diplopia on alternate cover testing.

Results: Four patients were male and one patient was female with a mean age of 40.6 years. All patients presented initially with ophthalmologic complaints. Each patient had a deep superior eyelid sulcus on the affected side with a mean enophthalmos of 3.8mm and hypoglobus of 2.8mm. All patients underwent simultaneous endoscopic maxillary sinus surgery with creation of a large antrostomy and orbital floor reconstruction using either porous polyethylene implants or autologous bone grafting. All patients experienced improvement of hypoglobus and globe position as measured by exophthalmometry. One patient developed transient hypesthesia of the nictitans.

Conclusions: Silent sinus syndrome is a rare condition and may present with either ophthalmologic or rhinologic symptoms. Recognition of the oculocutaneous changes and characteristic findings on imaging are essential in making this diagnosis. Treatment should be multidisciplinary and can be safely performed simultaneously.

INTRODUCTION

Silent sinus syndrome (SSS) is an often unrecognized clinical entity characterized by atelectasis of the maxillary sinus. The resultant contracture of the orbital floor effectively increases orbital volume and this is manifested clinically by spontaneous enophthalmos and inferior displacement of the globe. Many patients with this condition have little or no nasal and sinus symptoms and present with chronic and progressive enophthalmos, hence, the description, SSS.

The precise mechanism for maxillary osseous contracture and resultant atelectasis is unknown. However, chronic hypoventilation and subclinical sinusitis likely lead to negative pressure within the sinus and resultant collapse of the bony walls over time. Recent literature suggests that SSS is an acquired entity based on normal sinus imaging in patients prior to presenting with the syndrome.

Optimal treatment of SSS requires reanastomosis of the maxillary sinus combined with orbital volume restoration. Maxillary antrostomy through endoscopic approach is the preferred method of restoring maxillary sinus aeration while placement of orbital implants is the preferred method of volume augmentation. Various reports have described the timing and use of various implants. In this study, we report our experience with 5 cases of SSS treated with simultaneous endoscopic antrostomy and orbital implant placement.

METHODS AND MATERIALS

The records of all patients with silent sinus syndrome treated at a tertiary medical center in the last three years were reviewed. Inclusion criteria included imaging studies demonstrating maxillary sinus atelectasis and orbital floor collapse. Endoscopic antrostomy was performed. A transconjunctival incision 8mm beneath the inferior tarsal border was performed with cutting cautery. A subperiosteal dissection plane was created and the orbital floor was accessed. Excessive attention was made to avoid damage to the infraorbital nerve. Several types of orbital implants were used. Porous polyethylene (Medpor) with titanium mesh was used in two cases and this was placed over stacks of cut Medpor channel implants. In two cases, stacked Medpor channel implants were used alone. In the 5th case, autologous cranial bone secured to Macropore was used to restore orbital volume. In cases where fixation of the implant was insecure, a titanium screw was placed. Endoscopic sinus surgery was performed using an image guided system.

DISCUSSION

We report our experience of 5 cases of SSS managed with simultaneous endoscopic maxillary antrostomy and orbital reconstruction. All patients noted excellent cosmetic improvement in superior sulcus deepening and hypoglobus. No complications were noted from the placement of orbital implant at the same time of endoscopic sinus surgery.

A variety of different implants have been used previously in the orbital floor reconstruction of SSS patients. Rose et al (2003) used silicone block above the periosteum with good results without sinus surgery. Others have used autologous bone and dermis fat grafting for the volume augmentation (Ando and Cruz, 2005).

We primarily used variants of porous polyethylene implants in the reconstruction of the orbital floor bowing. Porous polyethylene with a barrier coat (Medpor barrier) was directed toward the orbital tissues to lessen the chance of adherence between the inferior rectus muscle complex and possible vertical muscle restriction. The opposite side of the implant was porous, facilitating vascular ingrowth and integration. Since the floor bowing was significant in these patients, placement of the porous polyethylene sheet would leave a dead space between the implant and orbital floor. To bridge this space, small strips of porous, non-barrier polyethylene was cut to size and stacked in this space to occupy additional volume. For case 5, autologous cranial bone was used for orbital volume augmentation. In this case, concern for microbial infection of the implant was the primary consideration. At the time of surgery, we aimed for a 1-1.5mm overcorrection of the enophthalmos and a 1.0mm overcorrection of the hypoglobus to allow for postoperative retraction.

Some authors suggest staged repair consisting first of endoscopic maxillary antrostomy to halt the atelectasis of the maxillary sinus followed by orbital reconstruction at a later time (Hunt and Tami 2000; Thomas et al, 2003). This reasoning was also thought to also lessen the chance of orbital implant infection or development of orbital cellulitis. Delay of orbital implant placement would likely lead to prolonged enophthalmos, hypoglobus and diplopia which are cosmetically and functionally unacceptable to most patients. Furthermore, simultaneous orbital and sinus surgery eliminates the need for additional anesthesia and surgery. In this small case series, we have found that simultaneous orbital and sinus surgery to be an acceptable and safe procedure in the management of SSS. The use of porous polyethylene implant was well tolerated in all patients with no extrusion or infection. All patients had excellent cosmetic and functional improvement in their periorbital and visual symptoms.

REFERENCES