Case Report

Delayed Orbital Emphysema Following Functional Endoscopic Sinus Surgery

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Abstract Orbital emphysema developing 3 days following a functional endoscopic sinus surgery (FESS) is uncommon, and delayed diagnosis and management can cause permanent vision loss. In the present case, no sequelae occurred despite delayed diagnosis and management. This case highlights the potential for delayed orbital emphysema following FESS.

Keywords emphysema; endoscopic sinus surgery; complications

1. Introduction

Since its introduction by Kennedy et al., functional endoscopic sinus surgery (FESS) has become the most common procedure for treating chronic rhinosinusitis and other sinus pathologies [2]. This minimally invasive procedure restores mucociliary clearance, drainage, and sinus aeration. However, patients may experience complications, ranging from self-limiting to life threatening, during or following FESS. Orbital emphysema is considered a self-limiting subclinical complication [5,7,8] that typically occurs within 24 hours postoperatively [5,8]. It is uncommon for orbital emphysema to develop 3 days postoperatively. We report a case of delayed orbital emphysema occurring after FESS and review the associated literature.

2. Case presentation

A 53-year-old man complaining of nasal obstruction was examined at a local medical center, where cranial magnetic resonance imaging (MRI) and paranasal sinus (PNS) computed tomography (CT) revealed a mucocele and septal deviation. The patient was referred to our facility for further management and underwent a right lateral FESS and septoplasty. Preoperative PNS CT and MRI revealed no anatomic variations except a lamina papyracea bony defect and periorbital fat protruding into the ethmoid sinus (Figure 1). Periorbital fat was exposed intraoperatively through the lamina papyracea defect, but there were no complications during the procedure. We removed the nasal packing (Ivalon) 1 day postoperatively and instructed the patient to avoid blowing his nose. Three days postoperatively, the patient complained of right lower eyelid swelling and peri orbital pain (Figure 2). Eye movement and visual acuity were intact on examination, and no crepitus was found. The ocular swelling and pain failed to improve...
The FESS complication rate has gradually decreased, but surgeons continued to encounter complications. These complications during or after FESS range in severity from self-limiting to life-threatening and can be divided into minor and major (based on severity), and intranasal, orbital, or intracranial (based on location) forms. Stankiewicz et al. [7] reported a 3% overall FESS complication rate; hemorrhage (n = 41) was most commonly reported, followed by orbital complications (n = 29) including orbital hematoma (n = 20) and orbital emphysema (n = 4). Krings et al. [3] reported a 0.36% major complication rate comprising skull base complications (0.13%) and orbital complications (0.23%) in primary FESS cases. Similarly, Ramakrishnan et al. [4] observed a 1% overall major complication rate comprising cerebrospinal leakage (0.17%), orbital injury (0.07%), and hemorrhage requiring transfusion (0.76%). Most orbital complications are considered major because of the potential permanent sequelae such as vision loss, but orbital emphysema is classified as a minor complication.

The most common cause of orbital emphysema is trauma such as an orbital wall fracture. Following injury, any expiratory effort such as coughing, sneezing, and nose blowing can trap air within the orbital tissues. Periorbital fat exposure, caused by lamina papyracea injury during FESS, behaves similarly to an orbital wall fracture. Postoperative expiratory episodes in patients with exposed periorbital fat frequently result in orbital emphysema. In reported orbital emphysema cases following FESS, symptoms usually develop within the first 24 hours following an expiratory effort [5,8]. Delayed orbital emphysema without expiratory effort occurring 3 days postoperatively, as reported here, is uncommon.

Orbital emphysema is a benign transient phenomenon that typically resolves without intervention or sequelae within 7 to 10 days. Therefore, it is classified as a minor complication in contrast to most orbital complications. Although the orbital emphysema diagnosis was delayed in this case, the patient completely recovered without continued adverse effects, as expected for a minor complication.

Standard orbital emphysema management is conservative and includes antibiotics, steroids, and avoidance of expiratory effort. However, in some cases, orbital emphysema causes vision loss secondary to compressive optic neuropathy, characterized by a ball-valve effect preventing air from escaping the orbit [6,7]. Worsened symptoms such as orbital pain, swelling, or vision loss may indicate acute compartment syndrome development. In these cases, surgery (lateral canthotomy or cantholysis) or needle decompression must be performed immediately to prevent permanent vision loss [1,5]. Therefore, any patient diagnosed with orbital emphysema should be closely monitored to prevent permanent adverse effects. Our patient had normal visual acuity and IOPs; thus, we determined that conservative management was sufficient based on the staging system developed by Hunts et al. [1].

4. Conclusion

Delayed orbital emphysema development more than 24 hours postoperatively is uncommon. Postoperative monitoring for orbital emphysema is important because delayed diagnosis and management can cause permanent vision loss. If orbital emphysema develops, the patient must be closely observed to prevent permanent complications. Furthermore, patients with preoperative or intraoperative lamina papyracea defects should be advised to avoid blowing the nose, coughing, and sneezing for at least 1 week postoperatively. Surgeons should suspend orbital emphysema in a patient with eyelid swelling following FESS; while conservative management is generally sufficient in most cases, surgeons should consider aggressive intervention in selected cases.

Conflict of interest The authors declare that they have no conflict of interest.

References


