Orbital Roof Subperiosteal Hematoma with Acute Visual Compromise: The Role of The Head & Neck Surgeon

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Abstract

Objectives: The primary goal of this study is to report our institutional experience of a rare, vision-threatening complication following craniomaxillofacial trauma.
Methods: A retrospective, electronic chart review was performed between January 2016 – January 2018 to identify 3 patients with evidence of orbital subperiosteal hematoma (OSPH) on computed tomography with confirmation on ocular examination. Visual acuity, intraocular pressures, and the need for surgical intervention were abstracted. Basic descriptive statistics were implemented in this analysis.
Results: The mean age at presentation was 53.3 years, with a male-to-female ratio of 2:1. Indications for surgical intervention include relative afferent pupillary defect, decreased visual acuity, and increased intraocular pressures. Preoperatively, mean intraocular pressures of the affected eye were 21.0. 2 patients required surgical OSPH evacuation via a medial brow incision with rapid exposure of the underlying subperiosteal space utilizing a Freer Elevator. Mean follow-up after initial ocular injury was 5 weeks, with a mean intraocular pressure of 16.5 postoperatively.
Conclusions: OSPH is an uncommon finding following craniomaxillofacial trauma necessitating vigilant diagnosis with a high level of clinical suspicion in patients presenting with acute visual impairment. Prompt assessment with consideration of operative intervention may mitigate deleterious long-term morbidity, chiefly complete loss of vision. Further studies may elucidate the optimal method in the management of this complex clinical entity.

Introduction

Orbital hematomas have classically been categorized as either intraorbital or subperiosteal[1]. Intraorbital, retrobulbar, hematomas have frequently been documented in the context of craniomaxillofacial trauma or surgery to the orbit[2-3]. Data reporting their occurrence is sparse. However, prior studies have estimated an incidence of 0.3%, particular after zygomatic fracture repair[4]. OSPH are even less common; occurring primarily in younger males as a direct result of facial trauma, although spontaneous occurrence after elevation of cranial venous pressure has been reported as well. Underlying etiologies of OSPHs have historically been divided into four subcategories: congestive, traumatic, spontaneous, and systemic. Congestive subperiosteal orbital hematomas occur in the context of elevated cranial venous pressure or venous congestion. While systemic SPH typically present in the context of a bleeding diatheses. Occasionally, no association is identified in which the disorder is termed spontaneous. Traumatic OSPH of the orbit, although rare, account for the majority of reports within the primary literature. There are few reported cases regarding the management of traumatic OSPH and even less that address the appropriate management of this disorder. Treatment options include conservative management, needle aspiration, or surgical intervention. This case series examines the presentation, evaluation, and treatment of OSPH of the orbit and contemporary management strategies.

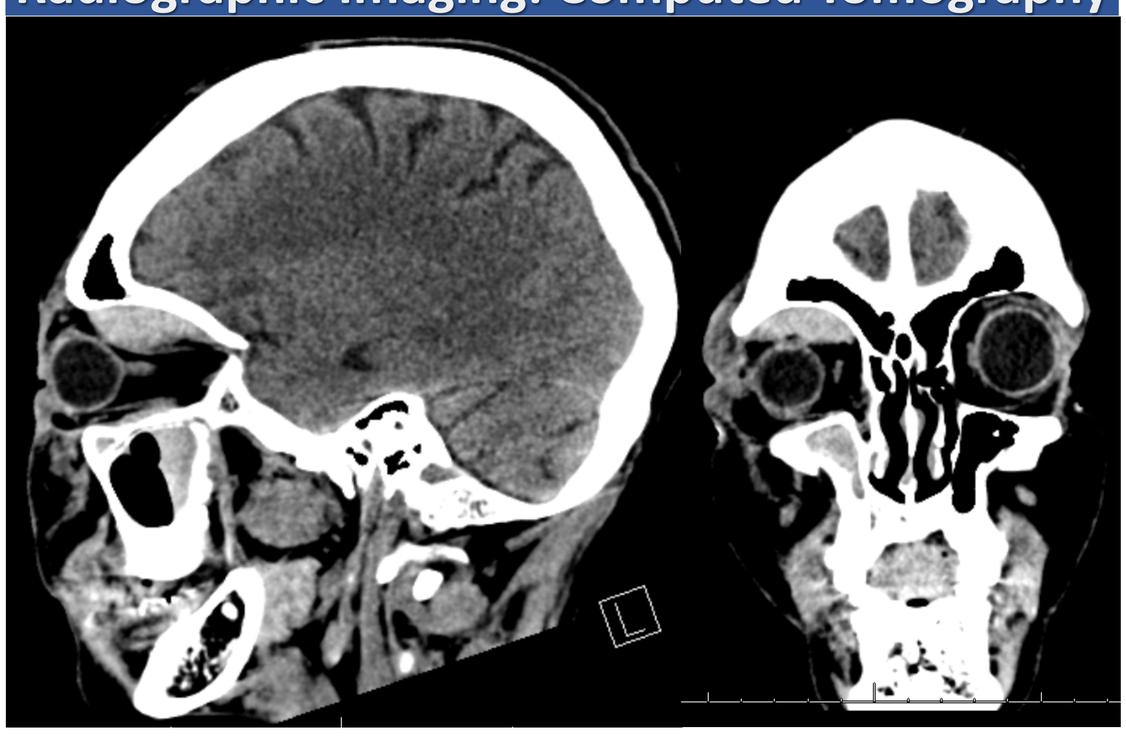
Methods and Materials

A retrospective, electronic chart review was performed between January 2016 – January 2018 to identify 3 patients with evidence of OSPH on computed tomography with confirmation on ocular examination. Visual acuity, intraocular pressures, and the need for surgical intervention were abstracted. Basic descriptive statistics were implemented in this analysis.

Results

The mean age at presentation was 53.3 years, with a male-to-female ratio of 2:1. Indications for surgical intervention include relative afferent pupillary defect, decreased visual acuity, and increased intraocular pressures. Preoperatively, mean intraocular pressures of the affected eye were 21.0. 2 patients required surgical evacuation via a medial brow incision. Mean follow-up after ocular injury was 5 weeks, with a mean intraocular pressure of 16.5 postoperatively.

Radiographic Imaging: Computed Tomography



36-Year-Old Male, Right-Sided OSPH After Mechanical Fall

Discussion

OSPH results following a violation to vessels supplying the periosteum. This pathology has been documented in infants following birth trauma due to the primitive attachment of the periosteum as well as in the elderly following blunt trauma due to weakening of periosteal attachments. As evidenced in our series, OSPH often involves the roof. This is likely due to the fact that the frontal bone contributes the most of the orbital surface area. Periosteal attachments in this region are not dense, and therefore have less strength, except at the suture lines. Consequently, this results in a potential space in which OSPH may develop. With age, this attachment has been shown to become stronger, and therefore more resilient, as reflected in the decreased incidence in adults. The two most common etiologies for OSPH development include shear force resulting in rupture of subperiosteal vessels or extension of a contiguous subgaleal hematoma[5]. Physical manifestations of OSPH include proptosis, inferior displacement of the globe, chemosis without conjunctival hemorrhage, absent lid ecchymosis, and motility impairment with varying degrees of associated visual impairment. The diagnosis of OSPH is facilitated with the use of computed tomography (CT), with both coronal and sagittal reconstructions. CT imaging allows for delineation of the anatomical location and size of the OSPH. Characteristic findings on CT include a broadly based mass lesion with high attenuation, abutting the frontal bone with displacement of orbital contents inferiorly[6]. OSPH may be managed conservatively; the period of observation is contingent upon the extent of visual impairment and concern for optic neuropathy. Rapid evacuation either via needle aspiration or exploration with drainage can be performed and has been well-documented in the literature. Risks with needle aspiration include re-accumulation of OSPH or insufficient drainage. In general, open approaches allow for evacuation of clot while addressing active bleeding with electrocautery and possible drain placement to prevent further recollection. Our series indicates that superior orbitotomy is the most commonly implemented approach in patients who are deemed surgical candidates with concern for acute visual compromise.

Conclusions

OSPH is an uncommon finding following craniomaxillofacial trauma necessitating vigilant diagnosis with a high level of clinical suspicion in patients presenting with acute visual impairment. Prompt assessment with consideration of operative intervention may mitigate deleterious long-term morbidity, chiefly complete loss of vision. Further studies may elucidate the optimal method in the management of this complex clinical entity.

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