Application of potassium-titanyl-phosphate (KTP) laser in the excision of pyriform fossa hemangioma

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Abstract Pyriform fossa hemangioma, especially of the cavernous type, is a rare case and very few such lesions have been encountered in general otolaryngological practice. We report such a lesion in a 36-year-old, middle-aged woman presenting with complaint of foreign body sensation in the throat. Examination revealed a hemangioma in the right pyriform fossa that was successfully managed using KTP-532 laser and bipolar cautery.

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1. Introduction

Hemangiomas are the most common congenital lesions in man and occur predominantly in the head and neck region [1]. A cavernous hemangioma of pyriform fossa is an extremely uncommon condition, and to the best of our knowledge, only two cases have been reported previously [2,3] Sweetser [4] in 1921 was the first to separate hemangiomas into two classes, located in subglottis in infants and in supraglottis in adults. Ferguson [5] and Kleinsasser [6] have both pointed out the difference between symptoms characterizing the infantile and adult forms. Hoarseness, dyspnea, hemoptysis, and dysphagia were the most common adult symptoms. By convention, hemangiomas are usually separated into 3 broad classifications: capillary, cavernous, and capillary-cavernous (or combined). In contrast to a true capillary hemangioma, the cavernous hemangioma is typically subcutaneous in location, frequently deeper, and is often ill-defined as to depth. These hemangiomas show a predilection in females [1].

2. Case report

A 36-year-old female teacher presented to us in the Department of ENT–Head & Neck Surgery, Kasturba Medical College, Manipal, India, with complaint foreign body sensation in the throat of 5 years’ duration. However, she had no complaints of odynophagia, breathing difficulty, or hemoptysis. On indirect laryngoscopy, a bluish cystic swelling was noted in the right pyriform fossa, which was confirmed by use of rigid 70° endoscopic telescopes. The left pyriform fossa and laryngeal inlet appeared to be normal. Lateral view of neck and chest radiographs were reported as normal. In view of the possibility of hemangioma, adequate pints of fresh blood were arranged before surgical intervention. KTP-532 laser–assisted excision of hemangioma was planned as the preferred approach.

3. Surgical procedure

On assessment with microlaryngoscopy under general anesthesia, the extent of the hemangioma was noted and was found to involve the medial wall of the pyriform fossa as shown in Fig. 1. Distinct trabecular mass filled with dark blood was seen. Mass was visualized as extending into the tissue but leaving the apex and lateral wall of the pyriform fossa free. Mucosa surrounding the hemangioma...
was grasped by microlaryngeal cup forceps and dissection was performed with help of KTP-532 laser and bipolar cautery with microstat of 0.6 mm and power of 8 W in continuous mode as shown in Fig. 2. The mass was excised in toto. Intraoperative bleeding was minimal and was controlled using gauze packing soaked with sterile aqueous solution of hemocoagulase isolated from Bothrops atrox or Botrops jararaca of 0.2 CU. Hydrogen peroxide was also used to wash the operated area. A Ryle’s tube was passed before extubation to avoid undue dynamic action during swallowing at the operated site after surgery. Histopathologic specimen showed multiple vascular channels lined with single layer of endothelial cells as shown in Fig. 3. Postoperatively, the patient was continued on antibiotics and discharged after 1 day of hospitalization. On follow-up after 1 week, 3 months, and 6 months, the patient showed good improvement in symptoms and had no complaints of dysphagia or foreign body sensation in the throat. A rigid endoscopic examination showed no evidence of recurrence of cavernous hemangioma in the right pyriform fossa as shown in Fig. 4.

4. Discussion

Hemangiomas are congenital malformations that can be managed conservatively in most anatomical sites. Exceptions are lesions that can cause airway obstruction or dysphagia.

Histologically, these tumors are composed of large, irregular, blood-filled channels lined with a single layer of endothelial cells between fibrous tissue septae of varying thickness [7]. Hemangiomas are diagnosed primarily by physical examination and history. Doppler ultrasound, computerized tomography, technetium scans, and plain radiographs can play a role in determining the presence and extent of these vascular lesions [1].

Recent advances in technology have made lasers a common management option. Seth et al [3] in 1996 reported a new technique of treating laryngeal and hypopharyngeal hemangiomas with Nd:YAG laser. Cavernous hemangiomas create a heat sink effect due to their configuration of large

Fig. 1. Preoperative photograph of cavernous hemangioma involving medial wall of right pyriform fossa.

Fig. 2. Intraoperative dissection of right pyriform fossa hemangioma.

Fig. 3. Histopathology of specimen showing vascular channels with single layer of endothelium.

Fig. 4. Postoperative rigid endoscopic view, 6 months later, showed no evidence of recurrence.
venous sinusoids that dissipates the laser energy and thus reduces the efficiency of Nd:YAG laser. Furthermore, it requires the endoscopic use of glass slides for reducing the risk of transmural injury [3]. Madgy et al [8], as well as Kacker et al [9], in 2001 have reported the use of KTP-532 laser in the management of subglottic hemangioma. We advocate the use of KTP-532 laser in the successful management of pyriform fossa hemangioma because of the various advantages it offers. A review of English literature failed to show any reported use of KTP-532 laser in the treatment of pyriform fossa hemangioma.

Cavernous hemangiomas are rarely encountered lesions in clinical practice by otolaryngologists and are to be kept in mind as being a rare possibility when symptoms of dysphagia or foreign body sensation is the presenting complaint. The treatment of such a lesion is challenging and the best treatment option must be attempted for a safe surgical excision. Numerous modalities in the treatment and management of hemangiomas have been proposed like Nd:YAG laser excision [3,10], CO₂ laser excision [11], electrocautery, cryotherapy [12], sclerotherapy, interferon alfa-2a [13], corticosteroids, embolization, and radiation therapy [14]. Some of these have been gradually abandoned as ineffective or because of various severe immediate to long-term adverse effects [15]. Among lasers, the KTP-532 laser has several advantages that make it ideally suited for excision of hemangiomas. The potassium-titanyl-phosphate (KTP) laser has a wavelength in the visible light range (532 nm). It does not require an aiming beam and can be delivered via fiberoptic fibers. It is also preferentially absorbed by hemoglobin and, therefore, is effective in the treatment of vascular lesions [16]. KTP-532 laser–assisted excision being a minimally invasive approach provides the advantage of minimal blood loss. The KTP-532 laser offers distinct advantages because it produces a zone of coagulation on either side of the incision, and as it cuts, it appears to seal the edges of the wounds. It is a quick, well-tolerated, minimally invasive procedure. An external incision and scar are avoided with this approach. The main disadvantage of the KTP-532 technique is the cost factor. However, the advantages described far outweigh the disadvantages. It is a simple, safe, and effective surgical treatment with great potential in the future if popularized among the ENT fraternity.

5. Conclusion

Pyriform fossa hemangiomas are rare lesions of the head and neck and their treatment is often challenging. We present a case report of hemangioma of the pyriform fossa that was successfully treated using KTP-532 laser and bipolar cautery. A 6-month postoperative follow-up did not reveal any recurrence. The advantages of this treatment modality are mentioned.

References