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Minimally invasive treatment of oral ranulae: adaption to an old technique

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Abstract

Oral ranulas are cysts in the floor of the mouth that result from the extravasation of mucous. Historically there has been little consensus on the ideal first-line treatment, but currently, definitive treatment involves excision of the sublingual gland, which can injure the lingual nerve and submandibular duct. Minimally invasive surgical alternatives such as marsupialisation have been proposed, but so far have been associated with a high rate of recurrence. The aim of this pilot study was to evaluate the success of a simple, modified suture technique for the treatment of oral ranulas that can be done in the outpatient department. We retrospectively analysed outcomes after the technique was used as a first-line treatment in 15 consecutive patients between 2011 and 2013. Although 2 attempts were needed in 4 patients, complete resolution of the ranula was seen in 13. Other than the need for a second attempt, and recurrent failure in 2 cases, there were no complications. This minimally invasive and quick procedure is a suitable first-line alternative to other less successful or higher risk options.

Keywords: Ranula; Sublingual gland; Mucous extravasation cyst; Minimally-invasive; Salivary gland surgery

Introduction

The sublingual gland, the smallest of the major salivary glands, sits in the space between the mucous membranes in the floor of the mouth and the mylohyoid muscle below. It is shaped like a tadpole with the head filling the anterior floor of the mouth and the tail trailing back in the salivary gutter to attach to the submandibular gland at the back of the mouth. The head of the sublingual gland (lesser sublingual gland) is effectively a coalescence of a number of discrete minor salivary glands. It has between 8 and 20 excretory ducts known as the ducts of Rivinus that discharge directly into the floor of the mouth. The tail (greater sublingual gland) is quite different and when it is present (in less than half of cases), as it drains through its own duct into the submandibular duct or directly into the floor of the mouth.[1] Awareness of this anatomical arrangement and its functional effect is vital to the understanding of the pathogenesis of the ranula and to choosing the most appropriate treatment. Rupture of one of the ducts of Rivinus can result in the extravasation of saliva into the surrounding tissues to form an extravasation cyst or ranula.[2] The tail (greater sublingual gland) seems to function more like the submandibular gland and can be disrupted surgically without causing a ranula, but this is not the case with the head. Before it was realised that it is important to maintain the integrity of the sublingual gland around the punctum of Wharton's duct, early experience with endoscopic retrieval of salivary stones regularly led to the induction of ranulas. The physiological explanation is that minor salivary glands

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Fig. 1. Untreated oral ranula.

Fig. 2. Decompression of ranula sac with needle.

can secrete against a pressure gradient, a feature not available to the major glands.

Ranulas are rare and tend to occur in young people.[3–5] Clinically, they manifest as a painless pseudocyst that can grow quite large and in some cases can bypass the mylohyoid muscle and extend into the neck to form a plunging ranula.[6] Historically, they have been notoriously difficult to manage and often recurred after surgical treatment.[7] The definitive treatment is to remove the offending sublingual gland, but this is not always easy. Surgeons can lose their way in the floor of the mouth if bleeding is unchecked, and the procedure has a high rate of morbidity with risk of injury to the submandibular duct and lingual nerve. The mucosa in the floor of the mouth is often shredded when the head of the sublinglual gland is teased off the oral mucosa to which it is welded by the ducts of Rivinus, leading to scarring and restricted mobility of the tongue.

An old technique familiar in Chinese publications is to place a suture through the roof of the ranula. The rationale is that the tract of the suture becomes epithelialised and forms a new route for the trapped saliva to drain into the mouth. The approach caused little morbidity but the results were unpredictable. Based on our understanding of the pathogenesis of ranulas we have adapted the technique to improve the success rate to over 85%. We describe the adapted technique in 15 consecutive patients with a primary ranula in the floor of the mouth.

Method

Consecutive patients who presented with ranulas were offered treatment with the modified suture technique between October 2011 and June 2013. All were treated under local anaesthesia in the outpatient department. Figs. 1–5 show the stages involved. Harrison confirmed that every ranula has a microscopic connection with a discrete unit of a minor salivary gland, which is a conduit for feeding saliva into the cyst.[8] The challenge is to identify the unit. The first stage is to aspirate the saliva with a wide-bore needle, and completely decompress the sac (Fig. 2). The sac is lined by connective

Fig. 3. Placement of first suture in decompressed ranula sac.

tissue and seals itself so the walls have to be pushed apart when new saliva is pumped down the connecting channel. Over the next 24–48 h the ranula begins to form again, but at this time the pool of saliva is small (about the size of a fingernail) and shows the site of the damaged and leaking unit of the gland. Patients are therefore asked to come back around 48 h later when 2 or 3 interrupted 3-0 gauge silk sutures are placed under local anaesthesia through the edge of the sublingual gland around the origin of the ranula (Figs. 3 and 4). The leaking salivary unit is caught within the sutures and strangulated. As the sutures usually also go through the ranula, they

Fig. 4. Immediate postoperative appearance.