

# Management of the Ranula

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One of the factors that limits an informed discussion on the management of ranulas is the relative rarity not only of this condition but salivary gland disease in general. For example, the incidence of salivary stones, reported as the commonest salivary condition, only occurs in 6 cases per 100,000 population. Benign salivary gland tumors have an incidence of 8 per 100,000 and malignant salivary tumors as little as 0.7 annually. Salivary ranulas occur much less frequently than salivary stones. In our salivary gland clinic, 570 of the 2,200 patients seen in the last 10 years had salivary stones. In this period only 11 patients presented with ranulas (2 of which were consequent to surgery for stones). The situation is compounded by the fact that mucocoeles present to more than 1 surgical discipline, which further dilutes clinical experience. No one individual has enough experience to develop new ideas and techniques that would challenge current accepted norms. De facto the management of many salivary gland conditions has been frozen in time. But this situation is slowly changing. A number of centers in Europe have specialized in surgical management of salivary gland disease. In these centers patients presenting with salivary stones in the middle or posterior duct have greater than a 75% chance of stone clearance and only 2% of cases subsequently undergo gland excision.<sup>1,2</sup> Despite these advances a consensus on the appropriate management of ranulas has not evolved. Over time, however, aspects of this condition have been clarified.

It would seem the vast majority of ranulas are extravasation cysts (approximately 90%).<sup>3</sup> This fact has important clinical applications because it means that the connective tissue capsule of the cyst need not be removed at the time of surgery. This is not particularly important in small lesions but in plunging ranulas it means that wide exposure through both the mouth

and neck is unnecessary. Once the cyst has been decompressed and the source of salivary secretion removed, the cavity will involute and seal itself naturally. Apart from rare exceptions or iatrogenic injury to the submandibular duct, the vast majority of ranulas arise from the sublingual gland. This gland consists of a finger of salivary tissue that is always in continuity with the submandibular gland and projects forward and upward from the posterior border of the mylohyoid to lie along the lateral floor of the mouth. The anatomy of this finger of tissue is complex and varies between individuals. The initial portion running forward with the submandibular duct is accessory submandibular tissue. The sublingual gland proper consists of 2 parts: one that is always present and visible in the anterior floor of the mouth (main gland) and another that lies below the mid portion of the submandibular duct and is only present in about one-third of individuals. The former discharges into the mouth through numerous small ducts; the latter drains into the submandibular duct.<sup>4</sup>

Management of a ranula depends on a number of factors but predominantly its size and position. In the process of removing stones from the hilum of the submandibular gland (consecutive series 150 cases) a technique has been developed that requires the sublingual gland to be mobilized and rotated laterally in the floor of the mouth.<sup>3</sup> The medial aspect of the sublingual gland is incised and on 3 occasions a ranula has developed (3 of 150). In these instances the condition has been recognised early (1 to 2 cm in diameter) and local excision of the cyst with adjacent local sublingual tissue had proved successful. Consequently small, well-localized ranulas will respond to local excision much the same as mucocoeles on the lower lip. Similarly small obstructive cysts associated with the orifice of Wharton's duct can be dealt with by ductoplasty. In practice, the majority of ranulas are relatively large at the time of presentation and the source of salivary secretion within the sublingual gland cannot be pinpointed. In most instances the ranula is localized to one side of the mouth and is easily identified by its blue color. If the diagnosis is in doubt, a needle aspirate will confirm the diagnosis through its raised amylase count. Saliva is very resistant to infection and the ranula can be drained with impunity.

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The most predictable method of eradicating a ranula is to remove the associated sublingual gland. This is not necessarily an easy operative procedure but can be most satisfying if undertaken in a clean bloodless environment. Results show conclusively that sublingual gland removal is associated with the lowest instance of recurrent disease (approximately 1%).<sup>5</sup> The enlarged cyst cavity need not be enucleated so surgery can be restricted to the gland itself. Unfortunately the morbidity of sublingual gland removal is relatively high. The flattened head of the gland is intimately attached to the oral mucosa and attempts at dissecting it from the mucosa result in numerous perforations. More importantly there is a risk of injury to Wharton's duct (2%), bleeding (1% to 2%), infection (1% to 2%), or paraesthesia of the lingual nerve (2% to 12%). A number of more conservative approaches that are compatible with office practices have been suggested; these include laser de-roofing,<sup>6,7</sup> cryotherapy, suture ligation, and variation on marsupialization.<sup>8</sup>

Simple de-roofing of the cyst cavity is associated with a high recurrence rate ( $\geq 60\%$ ). This is because the soft tissues in the floor of the mouth fall together such that the roof of the oral cavity soon heals. Baumash has championed the technique of packing the cyst cavity and his experience is that the incidence of recurrence drops from 60% to approximately 10%. The advantage of this approach is that surgery is relatively simple. The downside is that the results are unpredictable and the pack that is kept for 7 to 10 days is uncomfortable. The presence of the pack causes irritation and fibrosis around the cyst cavity and seals the portion of the sublingual gland feeding the cyst. From an intellectual perspective, marsupialization is unsatisfactory because the success of surgery is a matter of chance. If the incidence of recurrence is confirmed at 10%, however, a pragmatic

approach would be to adopt this technique as the initial treatment option.

In conclusion, the current standard of knowledge would suggest that:

1. Ranulas are extravasation cysts;
2. The majority of ranulas arise from the sublingual gland;
3. The condition is uncommon and few surgeons will encounter more than 1 lesion each year; and
4. Reliable eradication of the ranula comes from removal of the sublingual gland but the surgery is demanding and there is a definite complication rate and morbidity. A simpler approach open to all skill levels is marsupialization with the addition of packing. Recurrence rates seem to be reduced to a reasonable level (approximately 10%). Persistent recalcitrant lesions should be dealt with by sublingual gland excision.

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