RESEARCH PAPER

Ranula Decompression Using Stitch and Stab Method: The Aluko Technique

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Abstract

Background A ranula is a cystic lesion in the floor of the mouth, formed either as a retention cyst or pseudocyst as a result of extravasation of mucus in the surrounding tissue. It may be treated by micro-marsupialization, marsupialization or excision of lesion with or without the associated salivary gland. Marsupialization is usually achieved by cutting a slit and thereafter stitching the edges such that the epithelium of the exterior becomes continuous with that of the interior of a cyst. A stitch-and-stab technique of achieving patency of the created slit of marsupialized ranula is hereby presented.

Method A stitch and stab technique using four parallel consecutive strokes of the needle with attached polyglactin 910 suture material in alternately opposing directions was employed in treatment of 31 consecutive ranula patients.

Results 100 % success was achieved using this technique in 31 ranulas.

Conclusion This stitch-and-stab technique for marsupialization has proven to be very successful. It is recommended for use by the general medical community, as it requires the Clinician to possess only minimal surgical skills. Bartholin's cyst can be so treated.

Keywords Ranula · Aluko · Technique · Decompression · Stitch · Stab

Introduction

A ranula is a cystic lesion in the floor of the mouth, formed either as a retention cyst or pseudocyst as a result of extravasation of mucus in the surrounding tissue [1]. It may be treated by micro-marsupialization, marsupialization or excision of lesion with or without the associated salivary gland [2].

Marsupialization is usually achieved by cutting a slit and thereafter stitching the edges such that the epithelium of the exterior becomes continuous with that of the interior of a cyst [3]. This ensures continuous drainage as long as the slit remains open. It is desirable to have several methods of conducting a procedure. It is even advantageous to develop easier methods of achieving a surgical goal. Surgical techniques of performing procedures continue to evolve [4], with the aim of achieving higher success rates. The outcome of a stitch-and-stab technique of achieving and maintaining patency of the created slit of marsupialized oral ranula is hereby presented.

Patients, Method, and Description of Technique

This study was carried out following clearance from Institutional Review Board (Ethics) Subcommittee of National Hospital Abuja Nigeria, in accordance with the ethical standards set forth in the 1964 Declaration of Helsinki and its later amendments. Study period was from May 2009 to October 2016, recruiting consecutive consenting patients presenting with oral ranula. The method of marsupialization described in this study is known in the maxillofacial surgery department of National Hospital Abuja Nigeria as the Aluko technique, after the surgeon who developed it.

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The procedure was carried out under topical anaesthesia with or without sedation.

The stitch-and-stab technique is executed by using four parallel consecutive strokes of the needle with attached polyglactin 910 suture material in alternately opposing directions, such that there will be a total of eight points at which the suture material pierces the roof of the cyst as shown in Figs. 1 and 2. The loose ends of the suture are then pulled towards one another in readiness to make a knot; the force dynamics then ensure that tension is exerted between points 3 and 6. A slit is then cut at this point, oriented in parallel to the sutures placed earlier, but short of points 4 and 5 (Fig. 3). The sharp edge of the blade is turned away from points 4 and 5 so as to avoid cutting the suture. Mucinous material is seen to escape through the cut slit (Fig. 4). The knotted suture is left in place until it presumably drops off, being made of absorbable material. The patient was followed-up weekly until the suture disappeared, and quarterly afterwards for a year.

Comparison of results (numbers and percentages of failed procedures) with historical cases' (November 1999 to May 2009) was done.

Results

This technique has been used for 31 consecutive oral ranula patients with 100 % success (Fig. 4), by Doctors of all cadres from House Officers to Consultant in the Maxillofacial surgery unit of National Hospital Abuja. No recurrence of cyst was recorded during follow-up period which ranged from 7 to 31 months. Sutures disappeared 3–8 weeks post-operatively. No patient needed a repeat procedure.

Departmental records show that previous cases managed using conventional marsupialization method had to be

Fig. 2 Shows four parallel lines of suture piercing the oral epithelium at 8 points in a patient with ranula

repeated twice without success, in 1 of 19 patients (5 % failure in terms of number of patients involved, but 14 % in terms of number of procedures carried out).

No complications were recorded using the novel technique.

Discussion

The stitch-and-stab technique has been adjudged to be easily executed by practitioners. It can easily be performed by Practitioners with lower surgical skills. The 100 % success achieved in this study encourages its

Fig. 1 Shows schematic illustration of novel stitch-and-stab technique for marsupialization

Fig. 3 Shows the loose ends of the suture knotted and the sharp edge of the blade turned away from points 4 and 5 so as to avoid cutting the suture, as an incision is made to decompress the ranula. *Note* indentations in tissues of floor of mouth, caused by the tension in suture thread

recommendation to the medical community. It takes less time, needing only 1 suture. Placement of suture before cutting a slit obviates the need for use of potential tissue-crushing forceps to pick slit edges, thereby allowing uneventful healing and reducing chances of complications. The technique maintains patency of slit made in order to ensure decompression of mucocele and continuous drainage of its contents until continuity is established between the epithelium of the interior and exterior of the mucocele.

All 4 parallel lines of suture may be placed entirely on the roof of the ranula without involving epithelium overlying normal or uninvolved sensitive tissue (Fig. 5).

The conventional technique involving initial incision before placement of sutures results in loss of cyst contents, making incision edge-handling more difficult. Our novel technique does not involve direct handling of incision edges, while the suture pulls them apart. Epithelialization soon occurs across the cut slit within a few days, so that continuity of epithelial cover is established between the interior and exterior of the cyst while the suture holds the edges apart. The slit edges thereafter allow passage of fluid as they are prevented from closing up the channel created by the presence of epithelium on both sides. Recurrence of cyst occurs when cut-slit edges come in contact before epithelialization and thereafter heal in such a way as to recreate a roof over the previously decompressed cyst.

Our technique has also been used for maintaining patency of slit salivary gland duct following removal of sialolith, thereby securing flow of saliva and preventing formation of retention cyst.

Zhao et al. [5] in their study of 580 lesions, concluded that the recurrence rate of ranulas is determined by the method of surgical procedure employed in managing them. If simple incision and drainage of oral ranulas produce up to 100 % recurrence rates [6], while marsupialization produces significantly lower failure rates, it is apt to conclude that a key element for success resides in the efficiency of the surgical method employed in maintaining patency of the cut slit over many weeks as done in this study. Figure 6 shows a successfully managed case followed-up for 26 months after treatment using the stitch and stab technique.

Fig. 4 shows escape of mucinous fluid after slit is cut through roof of ranula in two patients. *Note* that the suture is usually not visible when the knot is in place, unless it is sought and pulled as shown in the picture on the left

Fig. 5 Shows 4 *parallel lines* of suture placed on the cyst without involving epithelium overlying duct of submandibular gland

The conventional technique, according to historical records, produced 14 % failure rate at our centre; this difference was found to be significant, and it is pertinent to note that the patient in whom the conventional method failed three times within 6 weeks was eventually treated successfully at the first attempt with the novel technique. He appeared to have unusually delicate sublingual soft tissues. The conventional technique has been reported by other authors to produce failure rates ranging from 15 to 67 % [5, 7]; Kumar and Gulivindala [8] reported failure rates of 61–89 %.

A method known as micro-marsupialization, first described in the literature at the beginning of this century, also produced 14 % failure rate in a paediatric population [9]. It has been described as an alternative, not a superior method [7, 9]. The failure rate of micro-marsupialization as reported in the literature, approximates with the results we achieved using the conventional technique. Our novel technique, however, produced 0 % failure, and was routinely carried out among consecutive patients regardless of age.

More aggressive procedures such as ranula excision with or without removal of sublingual salivary gland have been devised to curtail failure rates associated with other procedures. Yoshimura et al. [10] concluded after examining treatment results of 9 patients that ranula excision with removal of ipsilateral sublingual gland was the most reliable method for management based on low recurrence rates reported. It produces recurrence rates from 0 to 1.2 % [5, 10], but requires general anaesthesia unlike our technique which produced a comparable success rate.

Application of the Aluko technique in other surgical specialties is possible; Bartholin's cyst can be so treated. Also, it can be applied to pancreatic cysts, pilonidal cysts, and dentigerous cyst.

The technique can be applied to abscesses which open onto the skin. A non-absorbable suture may be used when patency of slit is desired for longer periods. Polyglactin 910 sutures used in this study took 3–8 weeks to fall off, probably due to effects of friction and possibly also chemical action of oral fluids and food substances which varies from patient to patient; this suture material normally takes 10 weeks to resorb completely [11].

In conclusion, this stitch-and-stab technique for marsupialization has proven to be very successful. It is

Fig. 6 Shows the ventral surface of the tongue of a successfully treated patient who had an oral ranula on the *right hand side*, as seen in Fig. 5, 4 weeks and 26 months post-operatively

recommended for use by the general medical community, as it requires the Clinician to possess only minimal surgical skills.

Compliance with Ethical Standards

Conflict of interest None declared.

Ethical Statement This study has been carried out with approval from ethical committee of National Hospital Abuja in accordance with the ethical standards set forth in the 1964 Declaration of Helsinki and its later amendments.

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