

Improvement of Operative Method for Ranula

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Abstracts We have performed the research to increase the treatment effect of ranula by sublingual gland excision. Subjects were 33 patients of plunging ranula, among them, 18 patients were study group, and 15 patients were contrast group. Male was 15 and female 18. The study group was treated by sublingual gland excision with marsupialization of cyst intraorally. The contrast group was treated by enucleation of cyst extraorally. Results of study group were compared to contrast group and treatment effects were estimated. Consequently, there was 1 case of infection and 1 case of hematoma after operation in study group. But there were 3 cases of damage to marginal branch of facial nerve, 1 case of infection, 2 cases of salivary fistula formation, 1 case of hematoma and 15 cases of skin scar in contrast group. All of 18 patients were completely healed in study group. In contrast group, 10 of 15 patients were completely healed and 5 patients recurred.

Key words ranula, sublingual gland excision

Introduction

The great leader Comrade **Kim Jong Il** said as follows.

“The most important factor in the current development of medical science and technology is to concentrate on solving the pressing scientific and technological problems in the health service.”(“ON THE FURTHER IMPROVEMENT OF THE HEALTH SERVICE” P. 18)

Ranula is “mucocele” occurred in sublingual gland. Ranula is a clinical term generally used for cystic lesions in the floor of the mouth [7, 8].

The term “ranula” is derived from the Latin word “rana” (meaning frog) and is a term used to describe a thin-walled, bluish, transparent cyst, which is said to resemble the underbelly of a frog [1, 3, 4].

There are two different concepts for the pathogenesis of ranula. One is a true cyst due to ductal obstruction with an epithelial lining, and the other is a pseudocyst due to ductal injury and extravasation of mucus without an epithelial lining [1, 14, 16]. Recently, typical ranulas have been considered exclusively as an extravasation phenomenon of the sublingual gland [6, 19]. It is said that ranula is the sublingual gland cyst because originating from sublingual gland [11, 12].

According to the variations of its extension, ranula has been classified into three clinical type; sublingual type, sublingual-submandibular type, and submandibular type. Sublingual type is simple ranula and, Sublingual-submandibular type and submandibular type are plunging ranula [8, 15, 18].

Simple (intraoral) ranula is much more common than the plunging (cervical) type. A simple ranula represents a localized collection of mucus within the floor of the mouth. In plunging ranula, the mucus collection is in the infra mylohyoid compartment of the neck with or without an associated intraoral collection. A plunging ranula may extend into the neck by either entering the facial plane between the mylohyoid and hypoglossus muscles where the deep lobe of the submandibular gland lies, or through a defect within the mylohyoid muscle (mylohyoid boutonniere) which may be congenital in origin [5, 8, 19].

Different approaches for treating ranulas have been described in the literature according to the different concepts regarding pathogenesis, such as simple incision, cyst extirpation, marsupialization and excision of the sublingual gland. And following the recent interpretation of the outcome, excision of the sublingual gland has been mostly recommended [1, 2, 5, 9, 11, 12]. It is known that enucleation of cyst and marsupialization has high rates of recurrence [9, 10, 13, 17]. This may be due to the lack of understanding of pathogenesis, types and originating tissue of ranula.

Enucleation of ranula themselves was not considered to be essential, since most of ranula are pseudocysts without epithelial lining. Marsupialization was not considered as the first choice for the treatment of ranula, because of frequent recurrences and extension to plunging ranula. On the basis of this viewpoint, we have performed the research to prevent the relapse of cyst and increase the treatment effect by sublingual gland excision with marsupialization of cyst intraorally for plunging ranula.

1. Research Subjects and Method

1.1. Research subjects

Subjects were 33 patients of plunging ranula, among them, 18 patients were study group, and 15 patients were contrast group. Male was 15 and female was 18. The distribution of age is from 6 years old to 50 years old.

1.2. Method

Under general or local anesthesia the study group was treated by sublingual gland excision with marsupialization of cyst intraorally. The contrast group was treated by enucleation of cyst extraorally.

1.3. Surgical technique of the study group

Under general or local anesthesia, the patient's mouth was held open with bilateral dental bite blocks and the tongue was retracted with a single silk suture. An incision that followed the anterior border of the submandibular duct was made and with sharp dissection the submandibular duct identified. The lingual nerve was identified to avoid its injury. The sublingual gland was separated from the submandibular duct and mucosa with sharp dissection. The cyst was opened and contents were removed with suction. Following removal of the sublingual gland, homeostasis was obtained, a rubber drain was inserted to prevent a collection of blood or saliva, and sutured to wound margin, and the mucosa of the floor of the mouth

loosely closed. And the compression dressing is applied on involved submandibular region. The drain was removed after 24 to 48 hours.

After operation we observed damage to lingual nerve, damage to marginal branch of facial nerve, infection, hematoma, formation of salivary fistula and skin scar. We followed up the patients during 2 years after operation. Results of study group were compared to contrast group and treatment effects were estimated.

2. Results and Discussion

2.1. Difficulty of tongue motion

We observed difficulty of tongue motion as dysfunction after operation. As shown in table 1, 10 of 18 cases (55.6%) in study group were associated with difficulty of tongue motion at the first day after operation and 6 of 15 cases (40%) in contrast group ($p < 0.05$). The difficulty of tongue motion is temporary dysfunction appeared by local pain and swelling caused by operation and disappeared with subsiding of these symptoms both in study group and in contrast group.

Table 1. Difficulty of tongue motion

Group	Case	After operation		
		1 st day	3 rd day	5 th day
Contrast group	15(100.0%)	6 [*] (40.0%)	3(20.0%)	—
Study group	18(100.0%)	10(55.6%)	6(33.3%)	—

* $p < 0.05$

2.2. Dysphagia

We observed dysphagia as dysfunction after operation. As shown in table 2, 12 of 18 cases (66.7%) in study group were associated with dysphagia on the first day after operation and 7 of 15 cases (46.7%) in contrast group ($p < 0.05$). The dysphagia disappeared both in study group and in contrast group at the fifth day after operation.

Table 2. Dysphagia

Group	Case	After operation		
		1 st day	3 rd day	5 th day
Contrast group	15(100.0%)	7 [*] (46.7%)	3(20.0%)	—
Study group	18(100.0%)	12(66.7%)	8(44.4%)	—

* $p < 0.05$

2.3. Damage to nerve

We observed damages to lingual nerve and marginal branch of facial nerve relevant to operation. We estimated to be damage to lingual nerve if the anterior portion of corresponding tongue was anaesthetized, and to be damage to marginal branch of facial nerve if the corresponding oral commissure was drawing downward.

As shown in table 3, the damage to nerve did not occur in study group, but 3 cases (20%) of damage to marginal branch of facial nerve occurred in contrast group.

Table 3. Damage to nerve

Group	Case	Lingual nerve	Marginal branch of FN
Contrast group	15(100.0%)	—	3(20.0%)
Study group	18(100.0%)	—	—

FN: facial nerve

The cause of damage to marginal branch relates to the operation procedure in the area that marginal branch of facial nerve courses. This reveals that the excision of sublingual gland in mouth is safer method for having no risk of damage to nerve in contrast to surgical approach through the skin of submandibular region.

2.4. Postoperative complications

We observed infection, formation of salivary fistula and hematoma as complications after operation.

As shown in table 4, there was 1 case (5.6%) of infection and 1 (5.6%) case of hematoma after operation in study group, but there were 1 (6.7%) case of infection, 2 (13.3%) cases of salivary fistula formation and 1 (6.7%) case of hematoma in contrast group.

Table 4. Postoperative complications

Group	Case	Infection	Salivary fistula	Hematoma
Contrast group	15(100.0%)	1(6.7%)	2(13.3%)	1(6.7%)
Study group	18(100.0%)	1(5.6%)	—	1(5.6%)

2.5. Skin scar

We observed formation of skin scar relevant to operative methods.

Table 5. Skin scar

Group	Case	Skin scar
Contrast group	15(100.0%)	15(100.0%)
Study group	18(100.0%)	—

$p < 0.05$

As shown in table 5, there was no skin scar after operation in study group, but there were 15 cases (100%) of skin scar in contrast group ($p < 0.05$). The skin scar in contrast group is the phenomenon inevitably appeared in surgical approach through the skin of submandibular region.

2.6. Effectiveness of treatment

We followed up the patients after 6 months for 2 years of operation, and estimated to be perfect cure if the cyst did not occur again and as relapse if the cyst occurred again.

As shown in table 6, all of 18 patients were completely healed in study group, but in contrast group, 10 (66.7%) of 15 patients were completely healed and 5 (33.3%) patients recurred. The significant difference was recognized between two groups ($P < 0.05$). We think that the cause of relapse in contrast group is because the original tissue of ranula, sublingual gland is not removed.

Table 6. Effect of treatment

Group	Case	Perfect cure	Relapse
Contrast group	15(100.0%)	10(66.7%)	5(33.3%)
Study group	18(100.0%)	18*(100.0%)	—

* $p < 0.05$

Conclusion

Excision of sublingual gland is a reasonable and radical method that has no recurrence in surgical treatment for plunging ranula.

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