Transoral Submandibular Gland Excisions: Avoiding the Unsightly Neck Scar in Select Patient Populations

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ORIGINAL ARTICLE

Transoral Submandibular Gland Excisions: Avoiding the Unsightly Neck Scar in Select Patient Populations

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Background & Objectives

Current Standard:

- Traditional transcervical excision is effective but carries risks:
  - Visible neck scarring (hypertrophic/keloid concerns).
  - Risk of Marginal Mandibular Nerve (MMN) injury.

The Alternative:

Scarless surgery

Transoral approach offers a cosmetically favorable option ("Scarless surgery").

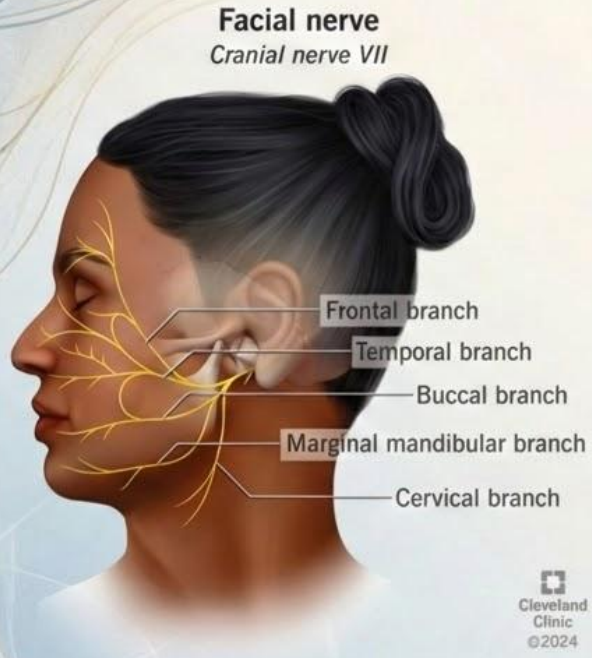
Challenge:

Limited adoption due to unfamiliarity with the transoral anatomy compared to the transcervical route.

Study Objective:

To evaluate the safety, efficacy, and complication profile of the transoral approach for benign pathologies

Anatomy


Facial nerve
Cranial nerve VII
Frontal branch
Temporal branch
Buccal branch
Marginal mandibular branch
Cervical branch
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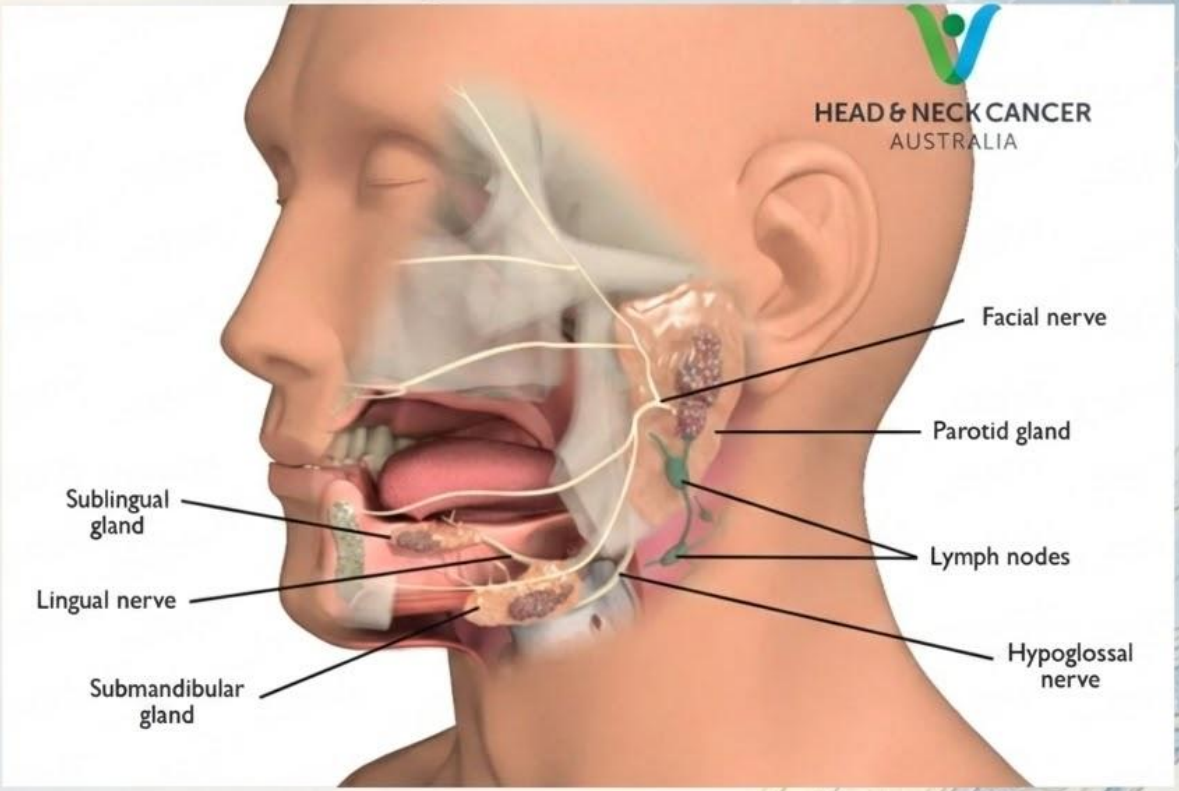
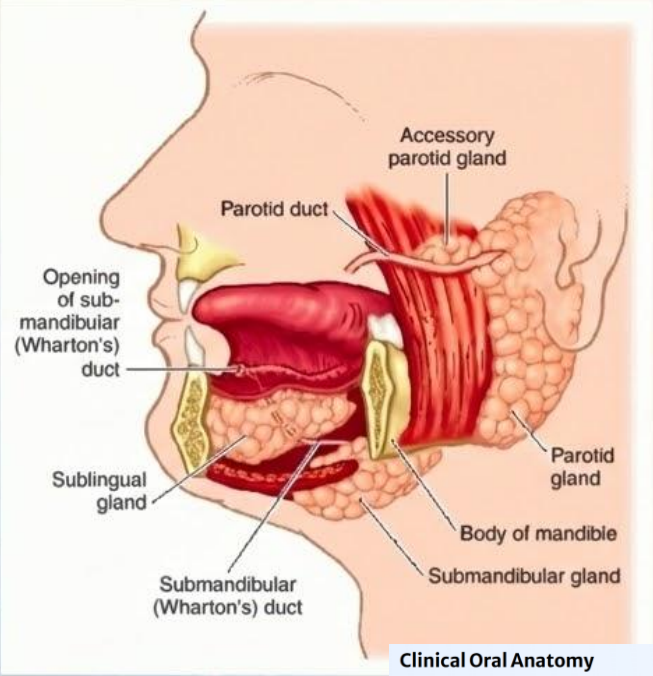
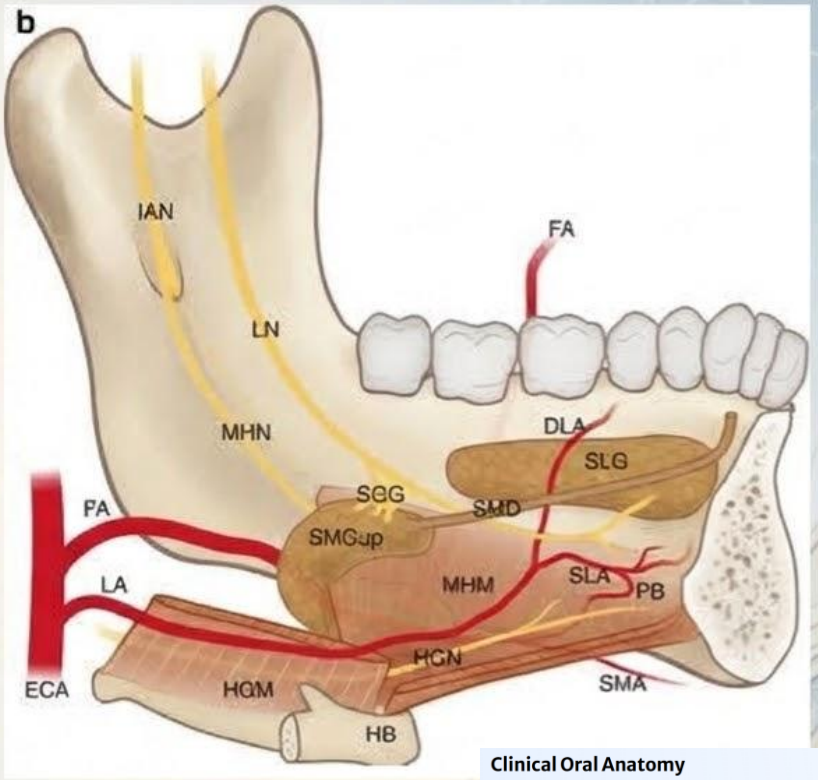

HEAD & NECK CANCER
AUSTRALIA
Facial nerve
Parotid gland
Sublingual gland
Lymph nodes
Lingual nerve
Hypoglossal nerve
Submandibular gland

經口手術視野:口腔底解剖構造 (Transoral Anatomy of the Floor of the Mouth)





Methods – Study Design

Study Design & Surgeon

Design: Retrospective case series (Single tertiary-care institution).

Surgeon: Performed by a single surgeon.

Patient Population (N=30)

Age range: 7–80 years.

Gender: Mostly female (21 Female / 9 Male).

Inclusion Criteria (Benign Only)

Benign pathologies only.

Benign Pathologies

24 (80)

Chronic sialadenitis

5 (16.67)

Ranulas

1 (3.33)

Pleomorphic adenoma

Surgical Technique

術前準備與麻醉 (Preparation & Anesthesia)

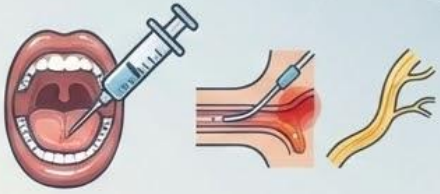
麻醉方式 (Anesthesia)

- 建議採用經鼻氣管插管 (Nasal Intubation) ，以保留口腔手術空間。
- 若需經口插管，管路應固定於對側。

病患擺位 (Positioning)

- 在對側放置成人尺寸的咬合塊 (Bite block) ，使口腔保持張開。
- 口腔使用 Chlorhexidine 進行消毒。

局部浸潤 (Infiltration)



- 於華頓氏管 (Wharton's duct) 開口周圍及舌下肉阜 (Lingual caruncle) 兩側注射含腎上腺素的局部麻醉劑，範圍延伸至大臼齒後區 (Retromolar area)。

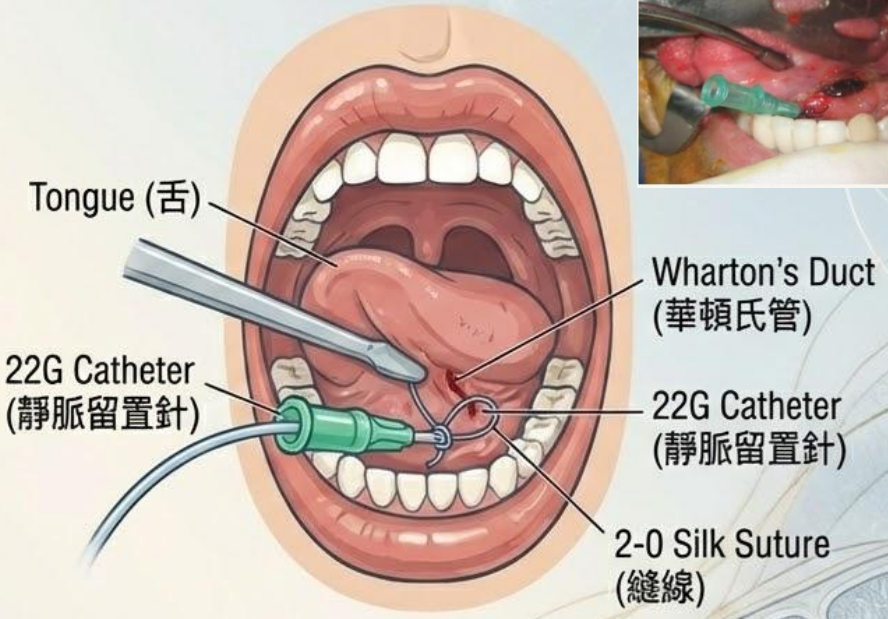
導管定位與切口 (Cannulation & Incision)

關鍵步驟 - 導管插管 (Cannulation)

- 使用 22G 靜脈留置針 (Angio catheter) 插入華頓氏管 (Wharton's duct)。
- 以 2-0 Silk 縫線環繞固定導管。

目的 (Purpose)

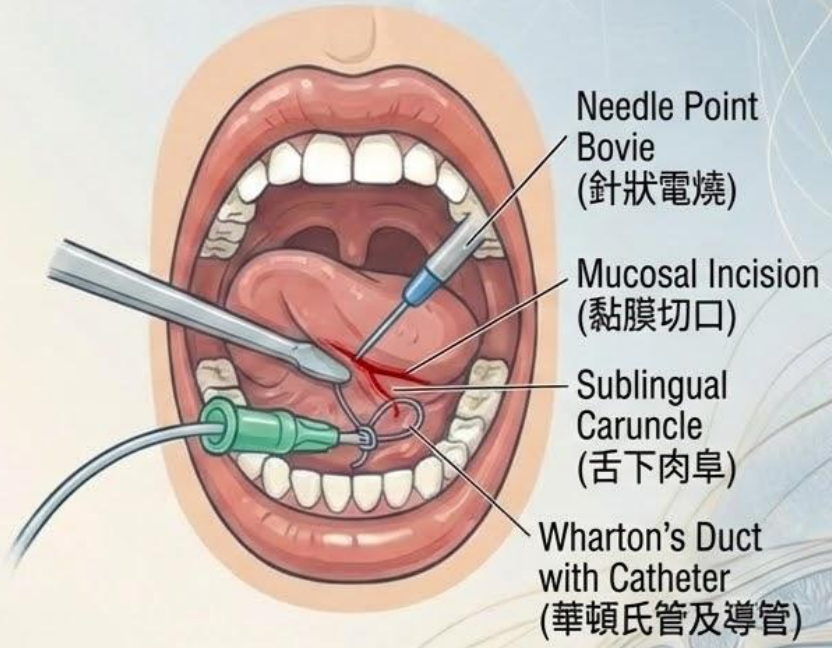
- 術中作為辨識導管的標記，避免誤傷，並協助釐清與舌神經 (Lingual Nerve) 的相對位置。



導管定位與切口 (Cannulation & Incision)

黏膜切口 (Mucosal Incision)

- 使用針狀電燒 (Needle point bovie)。
- 切口僅限於黏膜層 (Mucosal layer only)。
- 圍繞導管開口，並沿舌下肉阜兩側線性向後延伸 (Around the duct opening, extending linearly posteriorly along both sides of the sublingual caruncle)。



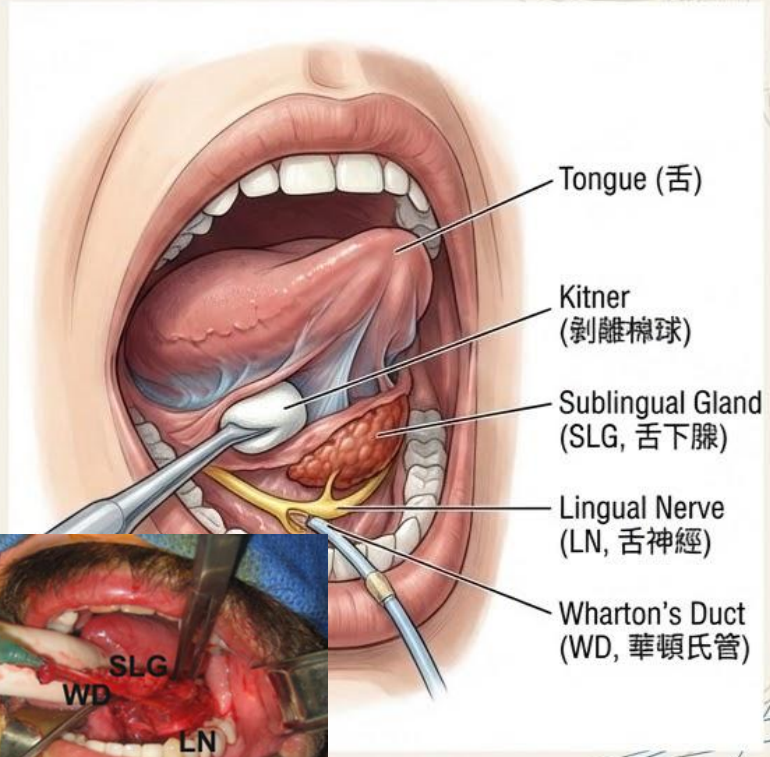
顯露與神經保護 (Exposure & Nerve Protection)

口底剝離 (FOM Dissection)：

- 使用 Kitner（剝離棉球）將黏膜從口底肌肉上分離，暴露舌下腺 (Sublingual Gland, SLG)。

舌下腺處理：

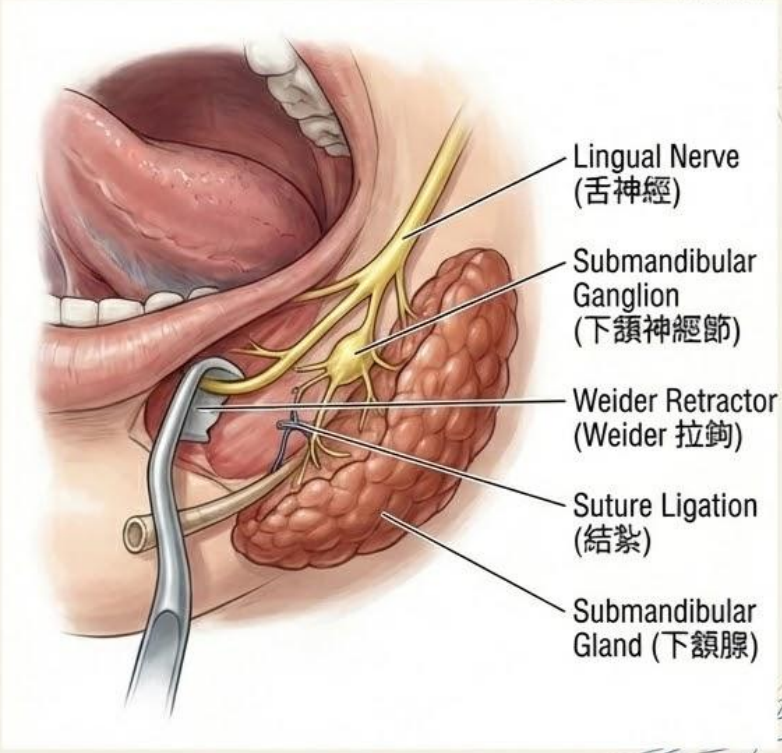
- 舌下腺位於舌神經（Lingual Nerve, LN）上方。
- 建議移除舌下腺以獲得更佳視野，看清舌神經。
- 注意：需將華頓氏管與舌下腺分開



顯露與神經保護 (Exposure & Nerve Protection)

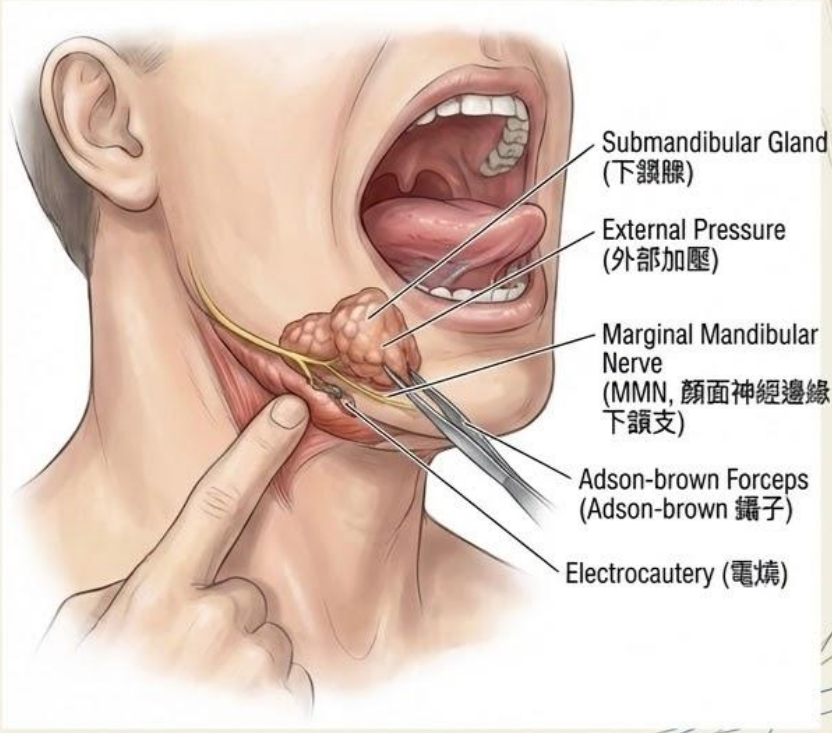
舌神經游離 (Lingual Nerve Release)：

- 辨識結構：
  找出連接舌神經與下頜腺深葉的下頜頜神經節（Submandibular Ganglion）。
- **結紮**：銳性剝離並結紮（Suture ligation）神經節分支。
- **保護**：使用 Weider 拉鉤將舌神經向內側牽引保護。



腺體移除 (Gland Delivery)

- **外部加壓技術 (External Pressure)：**
  - **關鍵動作**：助手需從下頷三角區（Submandibular triangle）由外向內施加指壓。
  - **目的**：將下頷腺推入口腔手術視野內。
- **剝離技巧 (Dissection Technique)：**
  - **後側**：從下頷舌骨肌（Mylohyoid muscle）後緣開始，向內側剝離。
  - **外側**：需使用鈍性剝離（Blunt dissection），避免電燒熱傷害波及顏面神經邊緣下頷支（Marginal Mandibular Nerve, MMN）。
  - **內側**：通常無強韌沾黏，手指剝離即可。
- **深部處理：**
  - 使用長 Adson-brown 鑷子夾住腺體深部，配合電燒（設定 15-20 Coagulation）將腺體完全游離。



血管控制與縫合 (Vascular Control & Closure)

- **血管處理 (Vascular Control)：**
  - 顏面動脈（Facial Artery）：通常藉由牽引腺體即可與血管分離。
  - 若有細小分支血管，直接電燒止血；主要動脈幹通常不需結紮。
- **檢查殘留 (Check for Residuals)：**
  - 大量沖洗傷口。
  - 雙手觸診檢查是否有殘留腺體組織（特別是前側較難清理的區域）。
- **傷口縫合 (Closure)：**
  - 使用 3-0 Chromic 可吸收線進行縫合。
  - 通常不放置引流管（除非是嚴重感染或糖尿病患者）

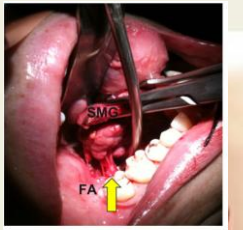
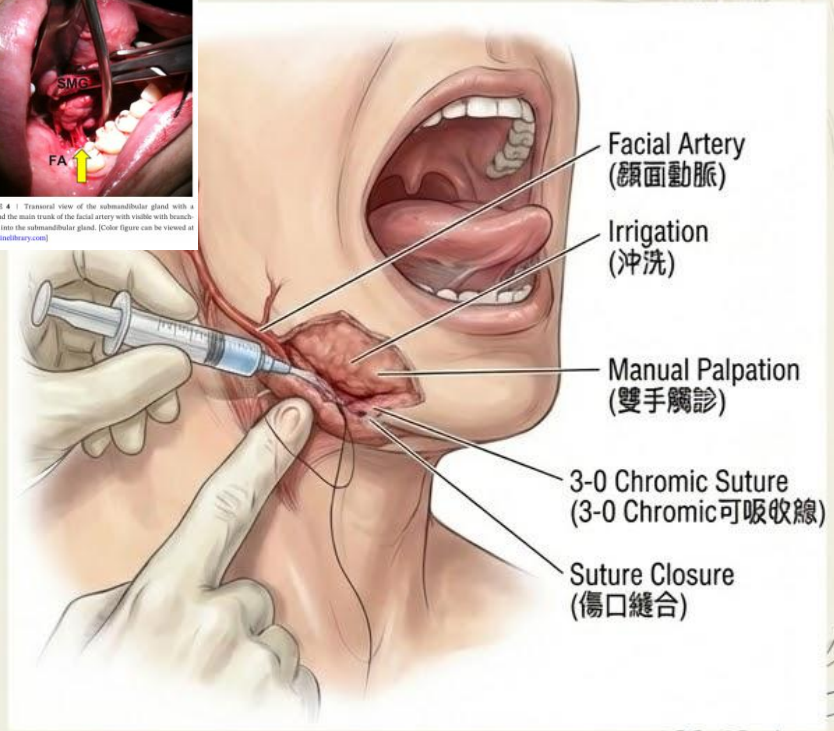


FIGURE 4 | Transoral view of the submandibular gland with a clamp and the main trunk of the facial artery with visible with branches going into the submandibular gland. [Color figure can be viewed at wileyonlinelibrary.com]



術後照護 (Post-operative Care)

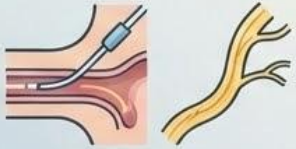
- **加壓包紮 (Pressure Dressing):**
  - 使用 Jaw Bra (下顎加壓帶) 或 Barton/Veronique 包紮法。
  - 重要性: 有效預防術後血腫 (Hematoma) 與血清腫 (Seroma)。

- **出院標準:**
  - 多數患者可於手術當日出院。
  - 飲食建議:流質或軟質飲食

Surgical Technique (Key Steps)

Technical Highlights

- **Anesthesia:** Nasal intubation preferred.



- **Critical Step:** Cannulation of Wharton's duct (22G catheter) to identify duct and protect the Lingual Nerve (LN).

Dissection

- Intraoral incision along the floor of the mouth.

- Sublingual gland dissection (often removed for better view).

- Identification and ligation of submandibular ganglion branches to free the Lingual Nerve.

Post-operative

- Gland delivered orally.

- Usually no drains; "Jaw bra" (pressure dressing) used to prevent hematoma.

Surgical Outcomes: Gland Excision & Scarless Result

FIGURE 5 | Submandibular gland with attached Wharton's duct and sialolith removed transorally. [Color figure can be viewed at wileyonlinelibrary.com]

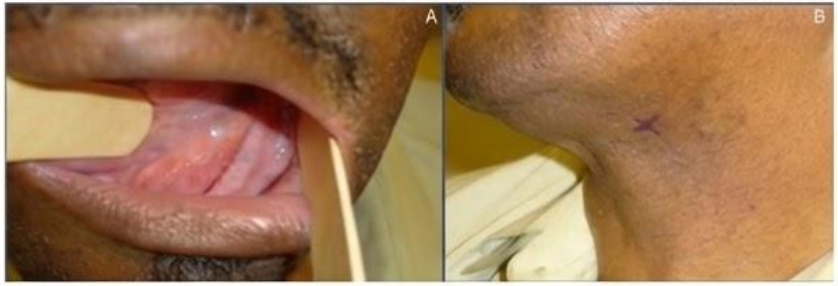


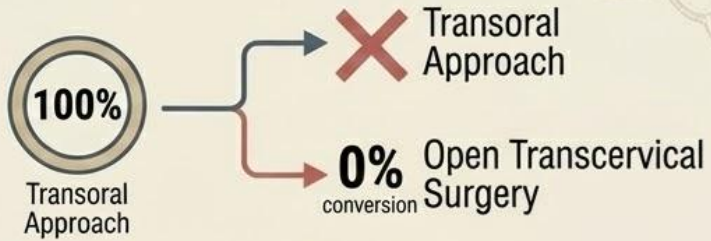
FIGURE 6 | (A) Transoral view showing mucosal scar after transoral resection of submandibular gland. (B) View of patient's neck, without any sear, particularly hypertrophic or keloid which may have resulted if transcervical route was performed. [Color figure can be viewed at wileyonlinelibrary.com]

Results – Operative Outcomes

- **Scar Avoidance:**

100% of patients avoided a neck scar.

- **Conversion Rate:**



0% conversion to open transcervical surgery.

- **Operative Time:**

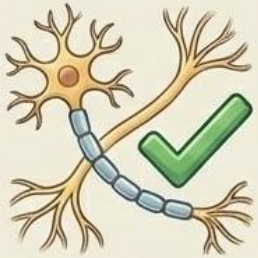
Average 95 minutes (Range: 45–200 min).

- **Hospital Stay:**

Most patients discharged on the day of surgery

Results – Complications

Permanent Nerve Injury:



0%

(No Hypoglossal or Marginal Mandibular Nerve injury).

Transient Complications:

10%

Tongue Paresthesia (numbness): 3 patients, all resolved within 6 weeks.

Infection:

6.6%

2 patients developed abscesses requiring antibiotics/drainage.

Hematoma/Seroma:

0 cases

No hematoma or seroma occurred.

TABLE 3 | Review of the literature of submandibular gland excisions using a transoral approach.

Study	Study design	No.	Mean age	Pathologies	LOS	Follow-up mean
Goh and Sethi [3]	Retrospective case series	93	39.75 (12–82)	Sialadenitis/ sialolithiasis (50), pleomorphic adenoma (31), others (12)	NR	12 months (non-neoplastic), 20 months (neoplastic)
Hong and Kim [4]	Retrospective case series	31	41 (14–67)	Chronic sialadenitis with stone (22), without stone (5), ranula (1), pleomorphic adenoma (3)	≤ 6 days	NR
Weber et al. [5]	Retrospective case series	7	NR	Chronic sialaadenitis (3), sialolithiasis (2), pleomorphic adenoma (2)	NR	30–32 months (for 2 patients with pleomorphic adenoma)
Kauffman et al. [6]	Retrospective case series	9	40.4	Chronic sialadenitis with sialolithiasis—3 patients Chronic sialadenitis (without specified sialolithiasis)—2 patients	2.4 days	NR

Feasibility of Transoral Approach (Previous Series)

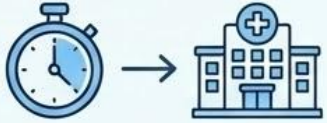
Context: Several retrospective case series support the feasibility of the transoral route for benign obstructive and neoplastic conditions.

Goh and Sethi (n=93): Largest series reviewed.

Pathologies: Sialadenitis, sialolithiasis, pleomorphic adenoma.

Follow-up: 12 months (non-neoplastic) to 20 months (neoplastic).

Hong and Kim (n=31):



Demonstrated **rapid recovery** with hospital stay **≤ 6 days**.

Kauffman et al. (n=9):

Reported a mean hospital stay of only **2.4 days**.

The Risk of Traditional Surgery: Nerve Injury

Historical Data (Transcervical):

Erbek et al. (n=45): Reported **15.6%** MMN weakness and **2.2%** Hypoglossal nerve dysfunction.

Berini-Aytes and Gay-Escoda: Reported **11.6%** MMN weakness.

Transoral Advantage:

MMN Risk: Minimal to **0%** (as lateral dissection is blunt and internal).

Trade-off: Higher incidence of transient Lingual Nerve (LN) paresthesia due to direct manipulation.

The Risk of Traditional Surgery: Hematoma

Hematoma Rates in Transcervical Approach:

Springborg et al.: Reported hematoma formation in up to 14% of cases.

Transoral Approach Outcomes:

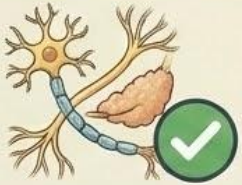
Current Study: 0% hematoma/seroma rate.

Key Factor: Success attributed to the use of "**Jaw Bras**" (pressure dressings) post-operatively, eliminating the need for drain.

Discussion

Transoral Approach

Cosmetics:
Eliminates external scarring.

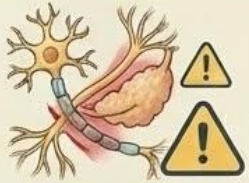


Nerve Safety (MMN):
Significantly lowers MMN weakness risk.

Lingual Nerve:
Slightly higher risk of transient numbness due to direct manipulation.

Transcervical Approach

Cosmetics:
Visible neck scar.



Nerve Safety (MMN):
11.6%–15.6% risk of MMN weakness.

Lingual Nerve:
Lower risk of transient numbness.

Limitations: Not suitable for malignancies due to the risk of tumor seeding from the pressure required to deliver the gland.

標題 (Title)：正面對決：經口 vs. 經頸入路之關鍵差異

特性 (Feature)	經口入路 (本研究)	傳統經頸入路 (文獻)
頸部疤痕	無 (0%)	必然存在
主要神經風險	舌神經 (10% 暫時性麻木)	邊緣下頜神經 (MMN)
MMN 損傷率	0%	高達 15.6%
舌下神經損傷率	0%	約 2.2% - 3.4%
術後血腫率	0%	高達 14%

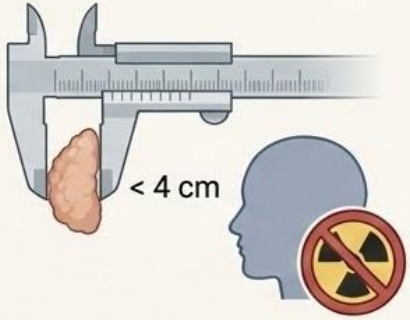
結論性陳述 (Concluding Statement)：經口手術以可控的、暫時性的舌神經風險，換取了對顏面神經和頸部美觀的絕對保護。

Conclusion

Viability

A feasible and cosmetically superior alternative for benign disease.

Patient Selection



Best for glands < 4 cm and patients with no history of radiation.

Key Benefit

Eliminates the risk of facial nerve paralysis and unsightly neck scars.

Analogy (Visualizing the Technique)

Traditional (Transcervical)

"Breaking down a wall to move furniture." Easier access, but damages the wall (scar) and risks hidden wiring (nerves) inside the wall.

Transoral (This Study)

"Moving furniture through the front door." Narrower exit requires skill, but the house exterior remains perfect.

Take Home Messages

Transoral Submandibular Gland Excision

Superior Cosmetic Outcome

- Achieves **100% scar avoidance**, offering a significant advantage for young patients or those prone to keloids.
- **0%** conversion rate to open surgery in this series.

Distinct Safety Profile

- **Facial Nerve Preservation:** Eliminates the risk of Marginal Mandibular Nerve (MMN) weakness (**0%** vs. 11–15% in traditional approaches).
- **The Trade-off:** Higher incidence of transient Lingual Nerve paresthesia (**10%**) due to direct manipulation, though self-resolving.

Strict Patient Selection

- **Indication:** Benign pathology only (Sialadenitis, Stones, Ranulas).
- **Criteria:** Gland size < 4 cm and no prior radiation history.
- **Contraindication:** Malignancy (risk of tumor seeding during delivery).

Key Technical Pearls

- **Cannulation:** Cannulate Wharton's duct to identify and protect the Lingual Nerve.
- **Hematoma Prevention:** Use a compressive "Jaw Bra" post-operatively; this effectively manages dead space without the need for drains.

Thank You

For Your Attention.