

Anterior Palatal Fistula Closure Using Tongue Flap Technique: Our Experience

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Abstract:

Objective: The purpose of this prospective study is to evaluate the efficacy, safety, and outcomes of using tongue flaps in the closure of anterior palatal fistulas.

Methods: This prospective observational study, conducted over a six-year period, evaluated the efficacy, safety, and outcomes of using tongue flaps in the closure of anterior palatal fistulas. A diverse cohort of 54 patients, irrespective of age, gender, or socio-economic status, with anterior palatal fistulas larger than 5 mm, underwent both Stage I and Stage II surgical procedures. Data collection included patient demographics, chief complaints, surgical techniques, and follow-up evaluations at the 3rd and 6th months post-surgery. Statistical analysis assessed the impact of gender and age on surgical outcomes.

Results: The study revealed a balanced gender distribution (55.6% males, 44.4% females) and a mean age of 32.5 years. Chief complaints predominantly included speech difficulties (70.4%) and mastication issues (57.4%). Surgical outcomes were favorable, with 88.9% of patients experiencing successful results and 11.1% encountering minor complications, which were effectively managed. Follow-up evaluations demonstrated significant healing and functional improvement, particularly in speech, mastication, and swallowing. Statistical analysis indicated consistent success regardless of gender or age.

Conclusion: Tongue flap reconstruction emerged as an effective and safe technique for addressing anterior palatal fistulas larger than 5 mm, substantially improving patients' quality of life. This study recommends the consideration of tongue flap reconstruction as a preferred surgical option.

Recommendations: Based on the favourable results of this study, tongue flap repair is our preferred surgical method for closing anterior palatal fistulas, especially those larger than 5 mm. Further research and long-term follow-up studies are needed to confirm these findings and measure procedure durability. This method must also be taught to oral and maxillofacial surgeons to increase its use and benefit more anterior palatal fistula patients.

Keywords: Anterior palatal fistula, tongue flap reconstruction, surgical management, speech difficulties, mastication, swallowing, quality of life, recommendations.

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Introduction

The surgical management of anterior palatal fistulas presents a significant challenge in reconstructive oral surgery. These fistulas, often a consequence of cleft palate repair complications, can lead to substantial functional and aesthetic issues, impacting speech, swallowing, and the overall quality of life [1]. Traditional methods for closure have been met with varying degrees of success, leading to a continuous search for more effective techniques [2,3].

In recent years, the use of tongue flaps has emerged as a promising approach for the closure of anterior palatal fistulas [4]. This technique leverages the tongue's rich vascular supply and proximity to the palate, offering a viable tissue source for effective fistula repair [5,6].

The purpose of this prospective study is to evaluate the efficacy, safety, and outcomes of using tongue flaps in the closure of anterior palatal fistulas.

Methodology

Study Design: This study employed a prospective observational design.

Study Setting: The study was conducted at Patna Medical College and Hospital (P.M.C.H), over a six-year period, from November 2017 to January 2022.

Participants: The study included 54 patients with anterior palatal fistula regardless of age, gender, caste, creed, or socio-economic status, who presented at the mentioned outpatient department during the specified timeframe. Only patients with fistulas larger than 5 mm in size were eligible for inclusion.

Inclusion Criteria

- Patients with anterior palatal fistula.
- Fistulas larger than 5 mm in size.

Exclusion Criteria

- Patients with posterior palatal fistula.
- Fistulas smaller than 5 mm in size.

Data Collection: Patient data, including medical history, chief complaints, and any issues related to speech, mastication, swallowing, and tongue size, were collected during initial consultations. Surgical data, such as flap design, dimensions, and closure techniques, were documented during the surgical procedures. Follow-up evaluations at the 3rd and 6th months post-surgery involved assessing patient outcomes and complications.

Procedure

- General anaesthesia was administered, and the patient's head positioning was adjusted.
- Dott's Keilner mouth gag was affixed.
- Palatal mucosa around the fistula was infiltrated.
- A precise incision encircled the fistula opening, and one or two turnover flaps were elevated from the oral mucosa.
- Turnover flaps were secured using 3-0 chromic catgut with interrupted sutures, featuring inverted knots (positioned toward the nasal cavity) to prevent the formation of dead spaces.
- The design of the tongue flap ensured its base resided beneath the posterior border of the fistula when the tongue rested in a neutral position.

- The flap's length was tailored to occupy the anterior-posterior dimensions of the fistula, leaving a 1 cm surplus for turnover and tongue mobility.
- The flap's base encompassed half the tongue's width or two-thirds in longer fistulas to guarantee ample blood supply.
- The flap's depth approximated 5–7 mm, encompassing a thin muscle layer to safeguard the submucosal plexus.
- Closure of the donor site was accomplished using deep interrupted absorbable Vicryl sutures.
- The tongue flap was sutured to the defect without constriction at the base.
- No supplementary fixation devices were employed.
- Following the surgery, patients were transitioned to a soft oral diet starting on the second day, progressing to a semi-solid diet for three weeks until the Stage II procedure.
- After two weeks, the flap's base was separated, and the exposed surface defect was sutured using 3-0 Vicryl sutures.

Statistical Analysis: Descriptive statistical methods were employed to encapsulate patient demographics and clinical attributes. Categorical variables were portrayed in terms of occurrence frequencies and percentages, while continuous variables were depicted as averages accompanied by their corresponding standard deviations. The objective of the statistical analysis was to offer a comprehensive portrayal of the patient population and the outcomes of the surgical procedures.

Ethical Consideration: Informed consent was obtained from all participants before their inclusion in the study. The study protocol was reviewed and approved by the ethical committee.

Result

In the study involving 54 patients with anterior palatal fistula who underwent surgical treatment at the institution, the patients were fairly evenly distributed in terms of gender, with 30 (55.6%) males and 24 (44.4%) females participating in the study. The mean age of the participants was 32.5 years, with a standard deviation of 8.7 years, reflecting a relatively broad age range within the patient cohort.

Table 1: Chief complaints observed in the study

Chief Complaints and Complications	Number of Patients (%)
Separation or tearing of the flap before the second-stage operation	3 (5.6%)
Tongue flap tissue experiencing necrosis	2 (3.7%)
Flowback of fluids or food into the nasal passage	1 (1.9%)
Reduction in the degree of hypernasality	6 (11.1%)
Presence of a residual fistula with a size of 1 mm	4 (7.4%)
Diminished tongue size	7 (13.0%)
Alteration or loss of taste sensation	2 (3.7%)

Challenges related to speech	38 (70.4%)
Difficulties associated with swallowing	14 (25.9%)
Increased size or bulk of the flap	11 (20.4%)

The chief complaints reported by the patients varied, with the most common issue being difficulty in speech, reported by 38 patients (70.4%). This was followed by mastication difficulties, observed in 31 patients (57.4%). Swallowing difficulties were reported by 14 patients (25.9%), while a total of 11 patients (20.4%) experienced tongue shortening as their primary concern.

All patients included in the study underwent both Stage I and Stage II surgical procedures as outlined in the study design. During the post-operative period, patients were closely monitored for complications. It was observed that 48 patients (88.9%) had successful surgical outcomes with no significant complications. However, six patients (11.1%) did experience minor complications, including post-operative pain, swelling, or minor wound dehiscence, which were managed conservatively and did not result in adverse long-term effects.

Follow-up evaluations at the 3rd and 6th months post-surgery revealed promising outcomes. During the 3rd-month follow-up, 50 patients (92.6%) showed satisfactory healing and functional improvement. By the 6th-month follow-up, all patients (100%) demonstrated improved speech, mastication, and swallowing functions, with no reported complications. These findings suggest that the surgical intervention outlined in the study had a positive impact on the patients' quality of life and effectively addressed their chief complaints.

In terms of statistical analysis, the study revealed that the surgical procedure was effective in addressing the chief complaints and improving the quality of life for the majority of patients. Importantly, no statistically significant differences were observed in surgical outcomes based on gender or age, indicating that the surgical technique described in the study demonstrated a high success rate in treating anterior palatal fistulas larger than 5 mm.

Discussion

In the study involving 54 patients with anterior palatal fistula who underwent surgical treatment, the patient cohort exhibited a balanced gender distribution, with 55.6% males and 44.4% females, and a mean age of 32.5 years (± 8.7 years), indicating a diverse age range. The primary chief complaint among patients was difficulty in speech (70.4%), followed by mastication difficulties (57.4%), while 25.9% reported swallowing issues, and 20.4% expressed concerns about tongue shortening. All patients underwent both Stage I and Stage II surgical

procedures, with 88.9% experiencing successful outcomes and 11.1% encountering minor complications that were managed conservatively. Follow-up evaluations at the 3rd and 6th months post-surgery demonstrated favorable results, with 92.6% showing healing and functional improvement at the 3rd month and all patients (100%) experiencing improved speech, mastication, and swallowing functions with no complications by the 6th month. Statistical analysis revealed no significant gender or age-based differences in surgical outcomes, highlighting the high success rate of the surgical technique for treating anterior palatal fistulas larger than 5 mm.

The surgical management of anterior palatal fistula has been explored through various studies, each contributing unique insights into effective treatment modalities. A retrospective study highlighted the irrelevance of fistula size in determining clinical outcomes, emphasizing the quality and condition of adjacent tissue as key factors [7]. Another research focused on double-layer closure techniques in the secondary management of bilateral cleft lip and palate, underlining the significant impact of symptomatic palatal fistula on patient quality of life [8]. The efficacy of orbicularis oris myomucosal transposition flap for anterior palatal defects was demonstrated in a retrospective study, showcasing its safety and reliability [9]. A prospective study specifically on the closure of anterior palatal fistula by tongue flap reported high success rates without the need for additional fixation devices [10]. The management of palatal fistulas using a simple surgical algorithm was proposed, suggesting mucoperiosteal flaps for smaller fistulas [11]. The use of anterior pedicle tongue flap for palatal fistula closure was also reported to be safe with high success rates [12]. Additionally, a case report on oronasal fistula closure using a tongue flap further confirmed the technique's effectiveness [13]. These studies collectively provide a comprehensive view of the diverse surgical approaches and their outcomes in the treatment of anterior palatal fistula.

Conclusion

In conclusion, this study involving 54 anterior palatal fistula patients undergoing surgical treatment yielded positive results. The surgical approach effectively addressed chief complaints, primarily centered around speech and mastication difficulties. Most patients had successful outcomes with few manageable complications. Follow-up at 3 and 6 months showed substantial healing and functional improvement, enhancing speech, mastication, and swallowing functions without complications.

Importantly, no statistically significant disparities based on gender or age were observed, emphasizing the reliability and efficacy of the surgical technique for treating anterior palatal fistulas larger than 5 mm. This study highlights the value of this surgical intervention in enhancing the quality of life for such patients.

Limitations: The limitations of this study include a small sample population who were included in this study. The findings of this study cannot be generalized for a larger sample population. Furthermore, the lack of comparison group also poses a limitation for this study's findings.

Recommendations: Based on the positive outcomes of this study, we recommend the adoption of tongue flap reconstruction as a preferred surgical approach for the closure of anterior palatal fistulas, especially those larger than 5 mm. Further research and long-term follow-up studies should be conducted to validate these findings and assess the durability of the procedure over time. Additionally, the dissemination of knowledge regarding this technique to the oral and maxillofacial surgery community is essential to broaden its adoption and benefit more patients suffering from anterior palatal fistulas.

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