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Description and Outcomes of Pfiefer Wavy Repair For Tessier 7 Facial Cleft

Dr. Nilesh Pagaria[1], Dr. Radheshyam Chourasiya[2*], Dr. Priyadershini Rangari[3]

[1,2] MDS, Oral and Maxillofacial Surgeon

[1]Associate Professor, Department Of Oral and Maxillofacial Surgery, Dentistry, Chhattisgarh Dental College and Research Institute, Rajnandgaon, Chhattisgarh

[2*]Consultant Maxillofacial Surgeon, Shri Krishna Hospital, Raipur, Chattisgarh.

[3]MDS,Oral Medicine And Radiology

[2,4]Assistant Professor, Department Of Dentistry, Sri Shankaracharya Medical College, Bhilai, Durg, Chhattisgarh.

Corresponding Author: Dr. Radheshyam Chourasiya , Consultant Maxillofacial Surgeon, Shri Krishna Hospital, Main Road, New Rajendranagar,

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Abstract

Facial Clefts are rare types of clefts presenting with wide variety and extent of facial deformity. The most lateral type of facial cleft is called as Tessier No 7 cleft or macrostomia. This type of cleft is associated with Hemifacial Microsomia, Treacher Collins Syndrome etc. As these are rare type of cleft there has been no consensus as to the type of repair gives the best outcome. In the past use of Z and W plasty type of repairs have been reported. We have used a straight line repair using Pfeifer wavy incision for the surgical repair of this type of clefts. In this article we review the literature and discuss the clinical features and early outcomes of 4 cases repaired using Pfeifer method.

Keywords: Tessier 7, Macrostomia, Straight line repair, Pfeifer.

Abbreviations: HFM-Hemifacial Microsomia

Introduction

Facial clefts other than cleft of lip and palate are rare facial deformities. Anatomically, Paul Tessier has described these rare craniofacial clefts. The no. 7 cleft is a lateral facial cleft consisting of macrostomia, lateral facial muscular diastasis, and bony abnormalities of the maxilla and zygoma.[1] Tessier No. 7 belongs in common to Treacher Collins and hemi-facial microsomia. It is a *temporo-zygomatic* (T. Z.) cleft, usually with absence of the zygomatic arch and concomitant deformities of the mandibular ramus, condyle and coronoid process. Absence of the coronoid process is related to an absence of the temporal muscle. The maxilla is short in the vertical plane, and the alveolus is sometimes hypoplastic. Incomplete clefts have been found in the molar region and between the maxillary tuberosity and pterygoid process. The soft tissue abnormalities include malformations of the ear and hypoplasia or absence of the temporal muscle.[2]

Transverse-facial clefts (macrostomia) of the face result from failure of the embryonic mandibular and maxillary process to properly fuse and form the corners of the mouth. Macrostomia may be an isolated phenomenon. But it is usually associated with other disorders such as:

mandibulofacial dysostosis, oculoauriculo- vertebral spectrum, Nager orofacial dysostosis, amniotic rupture sequence and many more. Lateral facial clefts associated with mandibular and auricular anomalies are actually a variant of bilateral facial microsomia. Macrostomia may be unilateral or bilateral, partial or rarely complete, extending from the angle of the mouth to the ear. Seen more commonly in males than females and when unilateral, more common on the left side. It may involve a slight groove, like thinning of the cheek or mild lateral displacement of the commissure. The external defect is always accompanied by an underlying muscle defect. The incidence of its occurrence is about 1 in 80 000 live births. Because of its rarity, the literature on reconstruction of macrostomia is limited. [3]

The objectives in repairing the transverse facial cleft involve symmetrical and natural appearance of the commissure, normal function of the orbicularis oris muscle and inconspicuous scars. Various surgical techniques have been recommended for repair of the cleft using a straight-line closure, Z- or W-plasty, local flaps, etc. Several problems remain such as deviation, distortion and scars in the commissure and cheek. [4]

In this article we present the clinical presentation of 4 cases of Tessier 7 facial cleft and early outcomes after straight line repair using Pfeifer Incision. Pfiefer incision is a wavy pattern incision used for cleft lip repair. Waves incorporated in the incision provides lengthening of the suture line.[5, 6]

Clinical presentations of the 4 cases reported in this series are described in Table 1. Clinical features are shown in Figure 1, 2, and a case of maxillary cleft is shown in Figure 3.

Surgical Technique

In all cases we performed cleft repair at the first opportunity. Positioning of the commissure was on measurement. A midline was established on the upper lip by a point between the peaks of Cupid's bow. The length between the lateral end of the upper lip on the normal side and the established midline was measured. The measurement was then transposed to the cleft side. On the lower lip, a point corresponding to the midline of the upper lip serves as the midline. The length between the lateral end of the lower lip on the normal side and the lower lip midline was measured. The measurement was then transposed to the cleft side.[3]We use the Pfeifer incision and a straight line repair. The incision is marked in a form of opposing curves once the distance between cupids bow and commissure on the non cleft side in both the upper and lower lips and duplicated on the cleft side. The skin and mucosa is excised and muscle dissection done. Mucosa was repaired and muscle approximation done. The skin repair done using starting from the modiolus region. In case with maxillary cleft, the cleft bone along with teeth was excised. The scar was most of the time straight with a mild wavy pattern. Wound healing was uneventful and scar was acceptable to all patients.

Discussion

Lateral facial Clefts/Tessier No. 7 Clefts are the most lateral type of facial cleft. It is a rare deformity usually associated with IST arch syndromes for e.g. Treacher Collins syndrome, Hemifacial microsomia. The cleft may extend from the corner of the mouth up to the tragus with varying extension. Two of the cases in this series were associated with HFM and 1 was IST arch syndrome. One patient had isolated Tessier 7 cleft. All of them were females as this type of cleft is common in females. The cleft/macrostomia extended to varying distances from the commissure towards the tragus. Other deformities associated were skin tags in preauricular region in 1 patient, tragal deformity in 2 patients and I patient had preauricular sinus. Maxillary cleft in molar region was present in1 patient. The clinical presentations of patient in this series were similar to as described by Woods RH et

al.[1] According to K.W. Butow, [7] the Tessier 7 cleft rotates superiorly (1st) at the angle of the mouth. There is also a central (2nd) and inferiorly rotation (3rd) transverse or lateral facial cleft, thus three different transverse clefts.

The objectives in the surgical correction of macrostomia are accurate positioning of the commissure, reconstruction of a functional oral musculature, skin closure with minimal visible scar, and no distraction secondary to scar contracture. [3]

Gleizal et al[8] achieved excellent functional results with normal phonation, facial expression and deglutition in case of posterior extension with myoplasty. The myoplasty in macrostomia could be limited to an orbicular re-orientation in case of minor form or can be associated with a masseter plasty or a pharyngoplasty in major forms. Two strategies have been used to repair the cutaneous defect in the transverse facial cleft. One is a straight-line closure for minimal scarring, and the other a geometric technique such as Z-plasty or W-plasty to prevent scar contracture. Rogers observed no lateral commissural migration after straight-line cutaneous closure, and concluded that Z-plasty or W-plasty is unnecessary in the repair of a transverse facial cleft.[3]

We have been using Pfeifer wavy incision design for repair of all types of Facial cleft which resulted in a straight line scar. The idea of using the curves in the incision is to gain length and obtain a straight line repair. The key factor is good release and approximation of the muscle resulting in good functional outcome.[3] There was no vermillion tissue transfer done neither a Z nor W plasty done in any of the cases as described by various authors.[7] Outcomes of all the cases were satisfactory as were the outcomes of simple straight line repair method described by Yoshimura et al[9] and HIKOSAKA et al.[10] There was no functional impairment or exaggerated scarring at 3 months follow up in 3 patients and 1 patient was lost to follow up. (Figure 5-13)

Conclusion

Straight line repair for Tessier 7 cleft using Pfeifer wavy line incision as a simple and a predictable method. The functional and esthetic outcomes were well accepted by the patients.

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Table 1: Clinical Description of Cases.

Features	Patient 1	Patient 2	Patient 3	Patient 4
Age in years	27	14	7	7
Sex	Female	Female	Female	Female
Complaints	Facial deformity	Facial deformity	Facial deformity	Facial deformity
Macrostomia	Yes	Yes	Yes	Yes
skin tags	No	No	Yes	Yes
Preauricular deformity	Yes,	Yes, Sinus	Yes	Yes
Eye problem	Yes	No	No	No
Facial deformity	Yes	No	Yes	Yes
Soft tissue deficiency	Yes	No	Yes	Yes
Facial Mid line deviation	Yes	No	Yes	Yes
Maxillary cleft/Duplication	No	No	Yes	No
Diagnosis	HFM	Tessier No. 7	First arch syndrome	HFM

Figures

Figure 1: Patient 1 lateral view pre and post operative

Figure 2: Patient 1 frontal view pre and post operative

Figure 3: Patient 2 frontal view pre and post operative

Figure 4: Pifiefer incision marking

Figure 5 : Maxillary cleft

Figure 6 : Preauricular deformity

Figure 7: Facial deformity and deviation of midline

Figure 8: Patient 3 pre and post operative

Figure 9: Patient 3 lateral view pre and post operative

Figure 10: Patient 4 frontal view pre and post operative

Figure 11: Patient 4 lateral view pre and post operative