

具挑戰性的複雜唇顎裂面部重建

Challenging Complex Cleft Maxillofacial Reconstruction

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Part I: Paediatric series - Introduction

Orofacial Cleft deformities are one of the most common antenatally detected anomalies. The incidence of cleft lip with or without palate in Asian population has found to be about 1.5-2.0 per 1000 births¹. Moreover, in a prevalence study conducted in Northern China² including live births, stillbirths, and pregnancy terminations showed oral clefts to be 3.27 per 1000 fetuses and or newborns. Therefore, antenatal detection by ultrasound examination could be significant, it had been quoted that the detection rate for oral cleft lip/palate was 87% in Hong Kong³. The incidence of terminations of pregnancy caused solely by diagnosis of an isolated facial clefts ranges from 0-92%⁴, especially women younger than 33 years old in Hong Kong. Thus, advocate of the antenatal counseling of fetal cleft deformity in the cleft multidisciplinary team could play a more crucial role⁵. In more than half a century, many clinical and laboratory researches in cleft surgeries had already offered a predictable functional and cosmetic outcome in the treatment methods with the basis of multidisciplinary team and sequential treatment approach.

Children born with cleft deformities involving different oral facial structures and functional deficiency that demand various health care practitioners co-operate in providing the specialized knowledge and skills necessary to ensure comprehensive care. As Hong Kong is a well developed economy country, multidisciplinary cleft team facilities is easily accessible in both public or private sector. Contrary, in those of under developed countries, always fast track repair to achieve essential oral function and satisfactory facial cosmesis would be the primary treatment goal. In this two-part series, the author would like to share his experience in management of four complex cleft patients in that difference of socioeconomic background to achieve an acceptable surgical outcome. The reconstructive surgeries in two patients were performed in mainland China remote county area contrasting to Hong Kong

modernized setting. Details in the modification of surgical planning and stepwise procedural illustrations will be fully elaborated.

This article will deliberately follow the sequential approach in cleft lip palate management from primary cleft repair to different phases of secondary reconstruction. Part I of the series is to describe the operative technique in management of two paediatric patients' complex cleft deformities. The first child was born with Tessier No.4 Craniofacial Clefts submitted for primary repair in Qinghai surgical mission, whilst the second child who suffered from excessive down-growth of premaxilla need alveolar bone grafting performed in Hong Kong. Stepwise operative technique and management concept will be fully elaborated.

Case I. Midface Rotation Advancement Repair of Tessier No. 4 Craniofacial Cleft

Case History : Female 11 months old Pre-op Anaesthetic assessment for this child with Patent Ductus Arteriosus (PDA) Left to Right shunt whom born with Tessier No.4 facial cleft <Bilateral>, the facial cleft extended to left lower eyelid resulting corneal exposure. Patient's mother brought the child to the surgical mission team for repair in April 2019 (Figure 1) .



Figure 1. Pre-operative 3D facial bone CT vs soft tissue defect assessment

圖 1. 術前 3D 面部骨骼 CT 與軟組織缺損評估

Surgical plan: Facial Unit & Muscle Repositioning Mid-facial Rotation Advancement repair without Z-plasties < Chang Gung's technique⁶.

Surgical Steps : Operation was performed in April 2019 at Qinghai (Figure 2-4)

1. Curvilinear line along the lower eyelid with para-nasal extension to the prolabial incision as a Facial Unit Approach
2. Transposition of the stumps of orbicularis oculi muscle via conjunctival incision for medial canthoplexy and plication of tarsal plate, accessory naso-lacrimal duct was ligated
3. Total mobilization of nasal facial skin flap after extensive sub-periosteal dissection of the cheek flap then advanced medially after meticulous repair of nasalis and other facia expression muscles
4. Excision of redundant skin edges after facial skin re-draping before layered skin closure
5. Repair of the orbicularis oris and nasogenial muscles as standard bilateral cleft lip straight line repair

Case II
Surgical management of excessive down-growth of premaxilla by 7mm Premaxillary impaction osteotomy and simultaneous alveolar bone grafting



Figure 5. Pre vs 5 years postoperative frontal smile view comparison
 圖 5. 術前與術後 5 年正面微笑視圖比較



Figure 6. Pre & 5 years postop occlusion and CBCT comparison
 圖 6. 術前和術後 5 年與 錐束 CT 影像比較

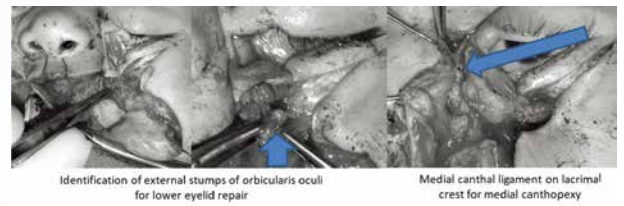


Figure 2. Plication of tarsal plate via trans-conjunctival orbicularis oculi muscle repair and medial canthoplexy
 圖 2. 經結膜眼輪匝肌修復和內側眼角固定術縫合附骨板



Figure 3. Redrapping of facial skin flaps repair and medial canthoplexy
 圖 3. 面部皮瓣的重新鋪貼



Figure 4. Pre & Postoperative 4 months comparison
 圖 4. 術前和術後 4 個月比較

Case History : 8 year-old Male born bilateral cleft lip and palate deformities with excessive down-growth of his maxilla with >1cm rest lip premaxilla exposure causing ambiguous smile and severely retroclined lower anterior deciduous incisors.

Surgical Plan : Operation was performed in July 2016 in Hong Kong with 5 years followup of dentofacial development (Figure 5-9)

1. Trans-oral vomerian osteotomy for premaxilla 7mm impaction pedicle with intact labial mucoperiosteal apron
2. Out-fracture of premaxilla for meticulous nasal floor repair and stainless steel wire fixation of the premaxilla segment
3. Water-tight labial and oral mucosal repair with packing of cancellous bone chips harvested from anterior iliac crest
4. Upper acrylic occlusal split fixation of the dental segments for 6 weeks
5. Patient with confident and happy frontal smile
6. Normal skeletal and dental growth at 5 years postop review

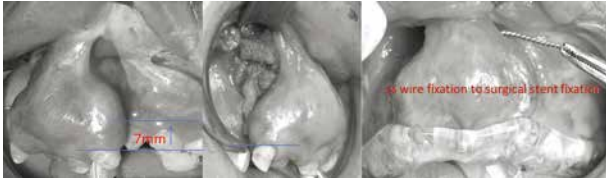


Figure 7. Perioperative photos showed the premaxilla 7mm impaction osteotomy and alveolar bone grafting and wire fixation to surgical stent

圖 7. 雙側口鼻瘻及牙槽骨植骨術前上頷骨截骨加線固定修復術圍術期照片



Figure 8. Pre & 1 year post-operative Lateral Ceph monitoring the premaxilla dentofacial development, retroclined lower incisors normalized inclination

圖 8. 術前和術後 1 年 Lat Ceph 監測前上頷牙頷面發育，後傾下切牙使傾角已經正常化



Preop 1cm Premaxilla exposure

1yr postop deciduous incisor exposure

5yr postop permanent incisor exposure

Figure 9. Frontal smile Pre vs 1st year and 5th years postoperative labiodental view

圖 9. 正面微笑 術後第 1 年和第 5 年正面唇牙暴露

Conclusion -Decision Making

Because of the variability and anatomical complexity in Craniofacial clefts, it poses significant reconstructive challenge to the cleft surgeon today. Conventional local inter-digitation technique for no. 3 & 4 facial cleft repair by medial canthopexy to protect the globe, lip repair and facial cleft repair that led to suboptimal results with conspicuous facial scars, unnatural facial expression etc. Chen & Chang et al in 2011 described facial unit and muscle repositioning advancement technique without Z-plasty⁶ definitely improve aesthetic outcome by avoid significant scarring, better skin color matching and more nature facial expression. When we saw such a rare facial cleft patient in Qinghai (Case I) even she presented with PDA cardiac anomalies, considerations in surgical and anaesthetic complexities were challenging. Nevertheless, we finally decided to perform such a complex reconstructive surgery in such limited medical facilities in Qinghai were mainly driven by patient's age and unacceptable facial appearance in Tibetan culture in addition to the lack of corneal protection due to the cleft deformities. Further secondary soft tissue repair and skeletal reconstruction normally schedule at least 3 years of age but more commonly by age 5.

In Case II, this patient presented with excessive down-growth of his premaxilla 10mm below lip line causing severe retroclined lower incisors and bizarre smile

appearance. Psychosocial impact to this young boy in his schooling age is fully envisaged. Fortunately, he was well cared under our multidisciplinary team in Hong Kong by interceptive orthodontics at suitable age. Orthopedic impaction of his premaxilla had attempted but unsuccessful. Timely attention in respect to the dentofacial growth should be scrutinized so that necessary interceptive orthodontic or early skeletal surgical treatment to remove adverse factor particularly malpositioned premaxilla segment. Therefore aggressive premaxillary impaction osteotomy is indicated to restore a normal maxillomandibular occlusion to facilitate normal mandibular growth and joyful confidence appearance in his peer.

When we plan for premaxilla impaction osteotomy, incision planning of nasal/labial and oral mucosa with special attention on the preservation of the labial mucosal apron was the corner stone of success. Transoral vomerian 7mm bone resection after out fracture of the premaxilla could facilitate excellent visualization for the nasal floor repair then trans-osseous stainless steel fixation of the premaxilla into the prefabricate surgical stent. Good condensation of cancellous bone chips into the repaired alveolar clefts further stabilize the osteotomized premaxilla osseous healing. We have monitored patient's dentofacial growth 5 years later with excellent occlusal relationship.

Part II : Adult series - Introduction

Two adult cleft patients presented in this series were Class III dentofacial deformities need surgical correction. It is not uncommon to see a hypoplastic maxilla in a previously repaired cleft lip and palate patient, and this is recognized as part of the secondary dentofacial deformity that causes class III dental malocclusion. Ross reported that approximately 27% patients presenting with significant hypoplastic maxilla did not respond well to orthodontic treatment alone, and a combined orthodontic-orthognathic treatment strategy was normally envisaged⁷. The presentation of maxillary hypoplasia with or without mandibular prognathism or pseudo-prognathism is almost universal and clear in all cleft patients at adolescence. In order to harmonize the facial aesthetic profile and achieve a functional occlusion, mid-facial maxillary advancement osteotomy, and sometimes with mandibular setback procedures, is often indicative. Moreover, velopharyngeal function had shown to be deteriorated following maxillary advancement in this group of patients^{8,9}. Defective speech problems are commonly seen in cleft patients such as hyper-nasality, nasal air emission, decreased intraoral air pressure for oral pressure consonants, reduced speech loudness, nostril or facial grimacing, and hyper-functional phonatory changes etc. It could be an intrinsic or structural deficiency that needs regular monitoring during growth period especially before age of 6 years old that demand diligent speech therapy or surgical correction. Study had shown approximately 25% of children with cleft lip/palate develop normal speech after primary surgery while approximately 75% require many interventions throughout childhood and adolescence to achieve acceptable speech production and language competence¹⁰.

Child of this age presents with persistent hyper-nasality due to defective soft palate velo-closure either soft palatal length or width or inadequate repair of velo-muscles or as a unfortunate sequelae of palatal flap failure causing large oronasal fistula in primary surgery. Further pharyngoplasty to correct or reduce the velopharyngeal incompetence (VPI) should be considered especially the patient has already undergone an extensive speech training that cannot compensate the structural deficiency.

When we saw this young adult in Qinghai during our surgical mission, his Class III dentofacial profile and severe velopharyngeal incompetence (VPI) demanded us to treat his deformities in one goal. We finally modified our surgical correction without adjunctive orthodontic support.

The second young female patient has undergone well co-ordinated multidisciplinary care in Hong Kong to manage her severe 3-dimensional maxilla hypoplasia with mandibular overclosure causing short face deformities.

CASE I

Skeletal Class III cleft dentofacial deformities with severe VPI managed by masking soft tissue augmentation

Case History: 21 year old male citizen of Sichuan suffered from severe retromaxilla profile and hypernasality came to the Qinghai mission team to seek for surgical reconstruction. His chief complaint was poor intelligible speech and prognathic profile. This became his social barrier both job seeking and girl friend relationship (Figure 1) .



Figure 1. Pre-op frontal, oropharyngeal, lateral profile views
圖 1. 術前正面、口咽、側面剖面圖

Final treatment plan : Operation performed in Qinghai April 2018

In view of the limitation of orthodontic resources and support in rural county , upper lip augmentation with free dermal fat graft augmentation to mask the retromaxilla profile with simultaneous Superior based pharyngeal flap for correction of his velopharyngeal incompetence.

Surgical technique:

1. Oral intubation.
2. Superior Based Pharyngeal flap pharyngoplasty
3. Harvesting of free dermal fat graft FDFG from iliac fossa
4. Revision of patient's old lip scar and extensive undermining of cutaneous skin and vermilion with scissors dissection
5. Inset of FDFG and anchored with trans-cutaneous sutures to tent the graft sub-cutaneously

1.1 Superior based posterior pharyngeal flap

Posterior pharyngeal flap had long been described by Passavant in 1865 by suturing of soft palate to posterior pharyngeal wall and Schoenborn in 1875¹¹ described the inferior based flap and this flap was popularized in United States by Pagett in 1930¹². Until 1971, Hogan introduced the lateral portal control pharyngeal flap¹³ obtained a good result in diminishing VPI. Technically, we adopted superior based flap as our standard tool for correction of severe

VPI. The advantage of this surgical approach providing an un-obstructing view during flap harvesting so as wound closure and flap inset into the splitted nasal side of the uvula (Figure 2) . The stenting with foley catheters as a patent lateral ports of the pharyngeal flap that could prevent postoperative scar contracture causing excessive obstruction of nasopharynx resulting in hyponasality and obstructive sleep apnea.

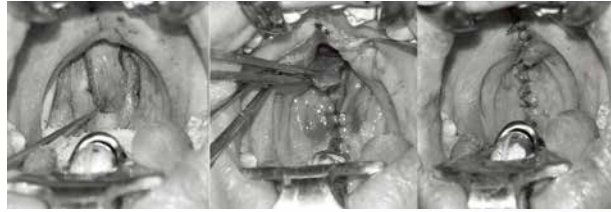


Figure 2. Superior based Pharyngeal flap for correction of VPI
圖 2. 用於矯正 VPI 的上緣咽瓣

Recent studies have shown longevity in speech improvement following takedown for posterior pharyngeal flap for obstructive sleep apnea. The potential serious complications of pharyngeal flap are perioperative airway obstruction and vascular accident. The administration of Dexamethasone (0.25mg/kg) in a prospective randomizing study had shown effectively to reduce the incidence of postoperative respiratory distress¹⁴. Special attention for pharyngeal flap width on anatomical anomaly of velocardiofacial syndrome that could cause significant intraoperative complications. Practically, the overall perioperative complications rate for posterior pharyngeal flap surgery found to be low¹⁵ (5.3%), and identified patients with underlying cardiac risk factors, severe American Society of Anesthesiologists Physical Status class and asthma will increasing the risk profiles (Figure 3- 4).



Figure 3. Free Dermal Fat graft insertion through revised lip scar for volume augmentation of upper lip as masking procedure
圖 3. 通過修復唇疤痕植入游離真皮脂肪移植以增加上唇體積作為掩蔽程序

Figure 4. Pre- and Postop 5 months lateral profile comparison
圖 4. 術前和術後 5 個月正面和側面輪廓比較



1.2 Free dermal fat graft augmentation

Free dermal fat graft was earliest described by Lexer in 1914 to repair nasal defect¹⁶. Thompson did extensive studies on autogenous dermis graft clinical application and its healing histological features¹⁷. Patel & Hall¹⁸ had elaborated free dermis fat graft to correct whistle deformity in patients with cleft lip in 2003. Chow & Chow in 2017 well described its application in cleft lip volume augmentation from vermilion, cutaneous lip to para-nasal region¹⁹.

CASE II Skeletal Class III with maxilla 3D hypoplasia with mandibular overclosure resulting short face

Case History : 21 year-old female presented with retruded mid-face and overclosed mandible as short face and cleft lip nose deformities. Intraorally her anterior segment presented as rotated upper incisors with well aligned buccal segments. Her retruded short face profile was causing her some social embarrassment. After thorough 3D and dentofacial analysis, a 2-phased surgical plan had proposed for Total Facial Lengthening :

1. Surgery First Approach SFA by Maxilla advancement and downgraft (Hip) and anterior dentoalveolar setback osteotomies to correct her CI III occlusion and facial lengthening then followed by postoperative orthodontics;
2. Six months later, radical rhinoplasty and vermilion fascia graft augmentation and genioplasty for definitive facial harmonization (Figure 5)

Surgical steps : Total Facial Lengthening – SFA bimaxillary osteotomies performed in July 2019 Hong Kong

1. 3D CT planning for the amount of Hip bone graft vertical augmentation and maxilla advancement
2. Le'Fort I maxilla advancement osteotomy with rigid internal fixation with Titanium bone plates and sandwiching of the iliac crest cortical cancellous bone graft and anterior segmental setback osteotomy.
3. Followed by post-surgical orthodontics
4. Six months later for open rhinoplasty with septal strut graft and alar base resection and vermilion fascia graft augmentation and simultaneous sliding genioplasty for final facial harmonization (Figure 6-11)



Figure 5. Pre and Postoperative lateral profile comparison
圖 5. 術前和術後側面輪廓比較



Figure 6. 3D skull printing to simulate the bone graft augmentation and bimaxillary osteotomies
圖 6. 3D 顱骨打印模擬骨移植增強和雙頷截骨術

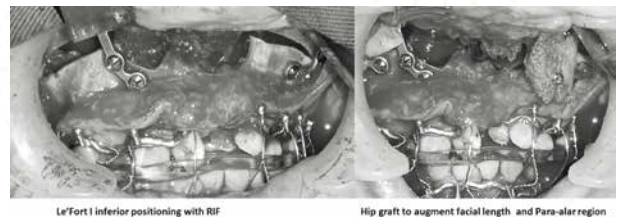


Figure 7. Perioperative view to show the bone graft augmentation according to the 3D planning at left para-alar region
圖 7. 手術前及後圖顯示根據 3D 計劃在左側鼻翼旁區域進行的髖骨植骨



Figure 8. Phase II lip nose revision and sliding genioplasty for facial harmonization
圖 8. 用於面部協調的唇鼻修正和頰成形術

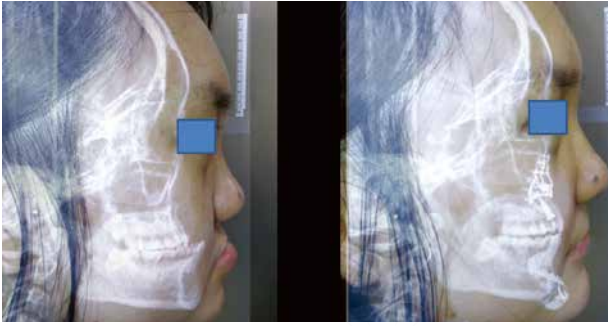


Figure 9. Pre and Postop 2 years Lateral Cephalometry comparison

圖 9. 術前和術後 2 年側面頭顱測量比較



Figure 10. Pre, immediate SFA postop and Postop 2 years Overject occlusion comparison

圖 10. 術前, 術後即刻 SFA 和術後 2 年 Overject 咬合比較

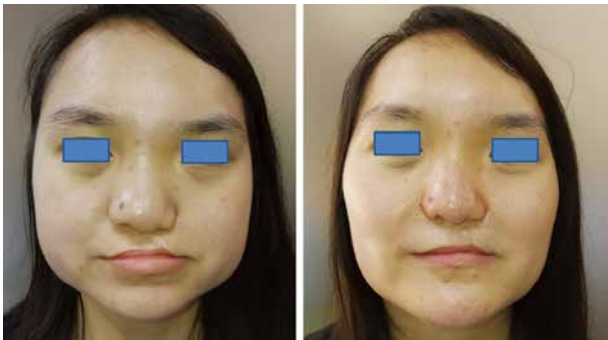


Figure 11. Pre and Post-orthognathic surgery 2 years harmonized frontal profile comparison

圖 11. 正頷手術前後 2 年正面輪廓比較

Conclusion - Decision Making

Inevitably, secondary cleft maxillofacial deformities developed due to the cumulative effects of functional and morphological abnormalities from the various stages of primary repair. In order to correct such a complex maxillofacial deformities that take almost two decades of time since primary surgery, a tri-phasic approach inter-phased by orthognathic surgery is essential. In both case I and II were similar secondary cleft Class III deformities but the consideration of involvement of orthodontic support was crucial. To accomplish profile improvement we opted for free dermal fat graft volume augmentation as correction of his nasolabial retrusion in area that is totally lack of orthodontic support. Simultaneous pharyngoplasty

using superior based pharyngeal flap technique is safe in conjunction with lip FDFG augmentation so that the patient could gain immediate improvement in both speech and facial profile after surgery.

For case II, her complex 3D naso-dentoskeletal deformities needs staged correction therefore expedient in surgical planning is beneficial to her psychosocial rapport. Moreover, she had 3-D maxilla hypoplasia and overclosed mandible resulting in short face appearance, interpositional bone graft augmentation of facial height should be indicated. High horizontal relapse rate could be up to 30%-37% in cleft maxillary advancement osteotomy whereas vertical relapse at A-point could be at 65%^{20,21} was of its inherent primary surgery sequelae. Various design and modifications of maxillary osteotomies were accompanied by simultaneous bone grafting and titanium mini-plates for rigid internal fixation in an attempt to enhance skeletal stability and surgical movement²². The evolving concept of Surgery First Approach in orthognathic surgery has recently more recognized in the medical literature. The lengthy pre-surgical orthodontic preparation of the dentition (15 to 24 months)^{23,24} that cause discomfort and psycho-social inconvenience to patient is well known. The bio-functional benefit of this approach to facilitate orthodontic forces by two reasons are : 1. Immediate resolution of hard and soft tissue imbalance prior to tooth movement²⁵, 2. The process of demineralization and remineralization consistent with the wound healing pattern of regional acceleratory phenomenon²⁶⁻²⁸. Chow et al in 2017 reported a quantitative analysis of the peri-operative parameters²⁹ namely surgical complexity, estimated blood lost and operating time by comparing conventional and surgery first approach SFA group in bimaxillary orthognathic surgery that all found to be similar statistically despite the pre-surgical orthodontic preparation was shortened significantly by 14.6 months. Case II patient showed very stable result by SFA with definitive lip nose reconstruction after a 2 years follow-up.

Acknowledgment

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具挑戰性的複雜唇顎裂面部重建

第一部分：兒科篇

一、簡介

口頰面裂畸形是最常見的產前檢測異常之一。在亞洲人群中，有或沒有腭裂的發生率約為每 1000 名新生兒 1.5-2.0。此外，在中國北方進行的一項包括活產、死產和終止妊娠的患病率研究顯示，每 1000 個胎兒和 / 或新生兒中有 3.27 個口腔裂腭。因此，超聲波檢查的產前檢測意義重大，據報香港唇腭裂的檢出率為 87%。僅因診斷為孤立性面部裂隙而終止妊娠的發生率為 0-92%⁴，尤其是香港 33 歲以下的女性，因此，裂隙多學科團隊提倡胎兒裂隙畸形的產前諮詢可以發揮更關鍵的作用。半個多世紀以來，在多學科團隊和序貫治療方法的基礎上，許多唇裂手術的臨床和實驗室研究已經在治療方法上提供了可預測的功能和美容效果。

出生時患有唇裂畸形的兒童涉及不同的口腔面部結構和功能缺陷，需要各種醫療保健從業者合作提供確保全面護理所需的專業知識和技能。由於香港是一個經濟發達的地方，公共或私營部門都可以輕鬆使用多學科的裂隙團隊設施。相反，在不發達國家，始終以快速修復達到基本的口腔功能和滿意的面部美容為主要治療目標。在這個由兩部分組成的系列中，作者想分享他在不同社會經濟背景下處理四名複雜唇裂患者以達到可接受的手術結果的經驗。兩名患者的重建手術是在中國大陸偏遠縣區進行的，與香港的現代化環境形成鮮明對比。將詳細闡述手術計劃的修改和逐步的程序插圖。

本文將特意遵循從原發性唇裂修復到二次重建不同階段的唇腭裂治療的順序方法。該系列的第一部分將描述治療兩名兒科患者複雜裂隙畸形的手術技術。第一個孩子出生時患有 Tessier No.4 顱面裂，在青海唇腭裂義務手術隊服務中接受修復整形，而第二個孩子因前上頷骨過度向下生長而在香港進行牙槽骨移植。全面闡述階梯式手術技術和管理理念。

案例一

Tessier 4 號顱面裂的中面旋轉推進修復

病史：女性 11 個月術麻醉前評估這個患有動脈導管未閉 (PDA) 左向右分流的孩子出生時患有 Tessier 4 號面部裂隙 < 雙側 >，面部裂隙擴展到左下眼瞼導致角膜暴露。患者的母親於 2019 年 4 月將孩子帶到青海唇腭裂外科義務手術隊要求進行修復 (圖 1)。

手術方案：面部單元和肌肉重新定位中面部旋轉推進修復無 Z 型整形 < 長庚技術 >。

手術步驟：2019 年 4 月於青海西寧進行修復手術 (圖 2-4)

1. 沿著下眼瞼的曲線，鼻旁延伸到唇唇切口作為面部單元方法。
2. 眼輪匝肌殘端轉位經結膜切口內側眼瞼板折疊術，結紮副鼻淚管。
3. 頰瓣廣泛骨膜下剝離後鼻面部皮瓣完全鬆動，然後在鼻部和其他面部表情肌的細緻修復後向內側推進。
4. 面部皮膚重新鋪貼後，分層皮膚縫合前切除多餘的皮膚邊緣。
5. 口輪匝肌和鼻基肌修復標準雙側唇裂直線修復。

案例二

7mm 前上頷骨嵌塞截骨和同步牙槽骨移植術治療前上頷骨過度向下生長

病史：8 歲男性出生雙側唇裂和腭畸形，上頷骨過度向下生長，>1cm 的上唇前上頷骨暴露導致奇怪的微笑，下前乳牙嚴重後傾。

手術方案：2016 年 7 月在香港手術，隨訪 5 年牙頷面發育 (圖 5-9)

1. 經口犁骨截骨術治療前上頷骨 7mm 嵌塞蒂，唇黏膜骨膜完整
2. 前上頷骨外骨折精細鼻底修復及前上頷骨段不銹鋼絲固定

3. 唇和口腔黏膜修復，從髁前嵴採集的鬆質骨填塞到修復的牙槽裂
4. 手術夾板固定 6 週
5. 術後自信快樂的正面微笑
6. 術後 5 年的正常骨骼和牙齒生長

結論 - 手術計劃決定

由於顱面裂的變異性和解剖學複雜性，它對當今的顱面外科醫生提出了重大的重建挑戰。傳統的局部交叉指縫合技術。No. 3 和 4 面部裂隙修復術以保護眼球、唇部修復和麵部裂隙修復導致不理想的結果，包括明顯的面部疤痕、不自然的面部表情等。Chen 和 Chang 等人在 2011 年描述了面部單位和肌肉重新定位旋轉的進展不使用 Z-plasty 的技術通過避免明顯的疤痕、更好的膚色匹配和更自然的面部表情來絕對改善美學效果。當我們在青海看到如此罕見的面裂患者 (病例 I) 時，即使她也出現了 PDA 心臟異常，手術和麻醉複雜性的考慮具有挑戰性。儘管如此，我們最終決定在青海如此有限的醫療設施中進行如此複雜的重建手術，主要是由於患者的年齡和藏族文化難接受的面部外觀以及由於裂隙畸形而缺乏角膜保護。進一步的二次軟組織修復和骨骼重建通常安排在至少 3 歲，但更常見的是在 5 歲之前。

在病例 II 中，該患者的前上頷骨在唇線以下 10 毫米處過度向下生長，導致下切牙嚴重後傾和奇異的微笑外觀。完全可以預見這個學齡小男孩的社會心理影響。幸運的是，他在我們香港的多學科團隊的照顧下，在合適的年齡通過攔截正畸治療。曾嘗試對他的前上頷骨進行正畸矯正，但未成功。應及時關注牙面頷生長情況，以便進行必要的截斷性正畸或早期骨骼手術治療，以去除不利因素，特別是前上頷骨節段錯位。因此，上頷前嵌塞截骨術可以恢復正常的上頷下頷咬合，以促進下頷的正常生長和同輩的快樂自信外觀。

當我們計劃進行前上頷骨嵌塞截骨術時，鼻/唇和口腔黏膜的切口規劃特別注意保存唇黏膜圍裙是成功的基石。前上頷骨骨折後經口犁骨

7 毫米骨切除術可以很容易看到鼻底修復，然後將前上頷骨經骨不銹鋼絲固定到預製手術支架中。鬆質骨良好地骨填塞到修復的牙槽裂中進一步穩定了截骨的前上頷骨癒合。我們在 5 年後監測了患者的牙頷面生長，咬合關係良好。

具挑戰性的複雜唇顎裂面部重建 第二部分：成人篇

一、簡介

本系列中出現的兩名成人唇裂患者是需要手術矯正的 III 型牙頷面畸形。在先前修復過的唇裂和腭裂患者中看到發育不全的上頷骨並不少見，這被認為是導致 III 型牙齒咬合不正的繼發性牙面畸形的一部分。Ross 報告說，大約 27% 的上頷骨發育不良患者對單獨的正畸治療反應不佳，通常會考慮採用正畸 - 正頷聯合治療策略。伴有或不伴有下頷前突或假性前突的上頷發育不全的表現在所有青春期唇裂患者中幾乎是普遍和明確的。為了協調面部美學輪廓並實現功能性咬合，面部中部的上頷前移截骨術，有時還有下頷後退手術，通常是需要的。此外，在這組患者中，上頷前移後腭咽功能已顯示惡化。有缺陷的言語問題常見於唇裂患者，如鼻音亢進、鼻腔氣排放、口腔壓力輔音的口腔內氣壓降低、說話響度降低、鼻孔或面部做鬼臉、功能性發音異常等。或在生長期需要定期監測的結構缺陷，特別是在 6 歲之前需要勤奮的言語治療或手術矯正。研究表明，大約 25% 的唇腭裂兒童在初次手術後可以正常說話，而大約 75% 的兒童需要在整個童年和青春期進行多次干預才能獲得可接受的言語能力和語言能力。

由於軟腭長度或寬度軟腭閉合缺陷或軟腭肌肉修復不充分，或作為不幸的腭瓣失敗後遺症導致初次手術中的大口鼻癩，這個年齡的兒童出現持續性鼻音亢進。應考慮進一步進行咽成形術以糾正或減少腭咽閉合功能不全 (VPI)，尤其是患者已經接受了無法彌補結構缺陷的密集的言語訓練。

當我們在青海看到這個年輕人時，他的 III 型牙頷面輪廓和嚴重的腭咽功能不全 (VPI) 要求我們將他的畸形可以一次性治療。我們最終在沒有考慮正畸支援的情況下調整了我們的手術矯正方案。

第二名年輕女性患者在香港接受了協調良好的多學科診治，以治療她嚴重的 3D 上頷發育不全，下頷過閉合導致短臉畸形。

案例一

上唇軟組織填充掩蔽 III 型牙頷面畸形治療及嚴重腭咽閉合功能不全 VPI 矯正

病史：21 歲四川男性，上頷骨後側輪廓嚴重，鼻音過重，來到青海唇腭裂外科義務手術隊尋求手術重建。他的主要顧慮是難以理解的語音發音。這成為他求職和結識異性關係的社交障礙。手術重建。他的主要顧慮是難以理解的語音發音。這成為他求職和結識異性關係的社交障礙 (圖 1)。

最終治療計劃：2018 年 4 月在青海進行的手術鑑於農村縣正畸資源和支持有限，上唇加厚游離真皮脂肪移植掩蓋上頷後輪廓，同時上基後咽瓣矯正腭咽功能不全。

手術技術：

1. 口腔插管。
2. 上基咽部皮瓣咽部成形術。
3. 從髂窩收穫游離真皮脂肪移植 (DFG)。
4. 從患者舊唇疤痕及廣泛游離皮膚及朱紅唇。
5. 插入 DFG 並用經皮縫合線錨定以皮下覆蓋移植植物。

1.1. 上緣後咽部皮瓣

1865 年，Passavant 通過將軟腭縫合到咽後壁，描述了咽後部皮瓣，1875 年 Schoenborn 描述了咽後部皮瓣，1930 年佩吉特在美國推廣了這種皮瓣。直到 1971 年，Hogan 引入了側門對照咽部皮瓣在降低 VPI 方面取得了良好的效果。從技術上講，我們採用上緣後咽部皮瓣

作為我們矯正嚴重 VPI 的標準工具。這種手術方法的優點是在皮瓣採集過程中提供無障礙視野，以便傷口閉合和皮瓣插入懸雍垂分裂的鼻側。(圖 2) 使用 Foley 導管作為咽部皮瓣的專利側端口的支架植入術可防止術後瘢痕攣縮引起鼻咽部過度阻塞，導致鼻腔低下和阻塞性睡眠呼吸暫停 (圖 2)。

最近的研究表明，在移除阻塞性睡眠呼吸暫停後咽部皮瓣後，言語改善可以延長壽命。咽部皮瓣的潛在嚴重並發症是圍手術期氣道阻塞和血管意外。在一項前瞻性隨機研究中，給予地塞米松 (0.25mg/kg) 已顯示可有效降低術後呼吸窘迫的發生率。腭心面綜合徵的解剖異常可能導致顯著的術中並發症，應特別注意咽瓣寬度。實際上，咽後瓣手術的整體圍手術期並發症發生率較低 (5.3%)，並且確定具有潛在心臟危險因素、嚴重的美國麻醉醫師協會身體狀況等級和哮喘的患者將增加風險狀況。(圖 3-4)

1.2 游離真皮脂肪移植增加

Lexer 在 1914 年最早描述了游離真皮脂肪移植來修復鼻部缺損。Thompson 對自體真皮移植的臨床應用及其癒合組織學特徵進行了廣泛的研究。Patel & Hall 於 2003 年詳細闡述了游離真皮脂肪移植以糾正唇裂患者的口哨畸形。Chow & Chow 在 2017 年很好地描述了其在從朱紅唇、皮膚唇到鼻旁區域的唇裂體積增加中的應用。

案例二

III 型牙頷面畸形上頷 3 維發育不全，下頷過度閉合導致短臉症

病史：21 歲女性，因短臉和唇裂鼻畸形而出現中臉後縮和下頷過閉。在口內，她的前牙節表現為旋轉的上切牙，頰節對齊良好。她後退的短臉輪廓給她帶來了一些社交尷尬。經過徹底的 3 維和牙頷面分析後，提出了一個兩階段的全臉增長手術計劃：

1. 手術先行方案 SFA 通過上頷前移和垂直的骨移植 (髌骨) 和下頷前段後退截骨術糾正她的 III 型牙頷面畸形咬合，然後進行術後正畸；
2. 6 個月後，根治性鼻整形術和朱紅唇筋膜移植增強術和頰部成形術，以實現最終的面部協調。(圖 5)

手術步驟：全臉增長整形術 – 2019 年 7 月在香港進行的 SFA 雙頷截骨術

1. 3D CT 規劃髌關節植骨垂直增強和上頷前移量。
2. Le' Fort I 上頷前移截骨術，採用鈦骨板剛性內固定，夾入髌骨皮質鬆質骨移植和下頷前段後退截骨術。
3. 其次是術後正畸。
4. 6 個月後進行開放式鼻整形術，鼻中隔支柱移植和鼻翼基部切除術以及朱紅唇面部移植隆起和同步頰部成形術以進行最終的面部協調 (圖 6-11)。

結論 - 手術計劃決定

由於早期手術修復不同階段的功能和形態異常的累積效應，無可避免繼發性裂頷面畸形的發展。為了矯正這種複雜的頷面部畸形，這種畸形自初次手術以來需要近 20 年的時間，因此必須採用正頷手術相間的三相方法。在這兩種情況下，病例 I 和 II 都是類似的繼發性裂腭 III 形面畸形，但考慮正畸的支援至關重要。為了改善輪廓，我們選擇了游離真皮脂肪移植體積增加術來矯正他完全缺乏正畸支持的區域的鼻唇後縮。使用上緣後咽後部皮瓣技術的同時頰部成形術與唇部 FDFG 增強相結合是安全的，因此患者可以在手術後立即改善言語和面部輪廓。

對於病例 II，她複雜的 3 維鼻 / 牙 / 頷骨畸形需要分階段矯正，因此手術計劃的權宜之計有利於她的心理社會融洽。此外，她有 3 維上頷發育不全和下頷過閉導致臉短，插入骨移植增加面部高度。上頷骨前裂截骨術的高水平復發率可達 30%-37%，而 A 點的垂直復發率可達 65% 是其固有的初次手術後遺症。上頷骨截骨術的各種設計和修改伴隨著同步骨移植和鈦微型鋼板用於剛性內固定，以提高骨骼穩定性和手術效果。最近在醫學文獻中更多地認識到正頷外科手術中手術首行 SFA 方法的不斷發展的概念。眾所周知，長時間的牙列術前正畸準備 (15 至 24 個月) 會給患者帶來不適和心理社會不便。這種方法通過兩個原因促進正畸力的生物功能益處是：1. 在牙齒移動之前立即解決硬組織和軟組織失衡，2. 脫礦和再礦化的過程與區域加速現象的傷口癒合模式一致。Chow 等人在 2017 年報告了一項對圍手術期參數的定量分析，即手術複雜性、估計的失血量和手術時間，通過比較雙頷正頷手術中的常規和手術先首行 SFA 組，儘管術前進行了手術，但所有這些都在統計學上相似正畸準備時間顯著縮短了 14.6 個月。病例 II 患者通過 SFA 顯示出非常穩定的結果，並進行了明確的唇鼻重建。

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References:

1. Moosey PA, Little J, Munger RG et al, Cleft Lip and palate . *Lancet* 2009;37:1773-85
2. Li Z, Ren A, Liu J, Zhang L, et al, High prevalence of orofacial clefts in Shanxi province in Northern China 2003-2004. *Am J Med Gent A* 2008;146A:2637-43
3. Lau JD, Huang YH, Hung TH et al. Ethical Discussion: Termination of Pregnancy after prenatal diagnosis of cleft lip in a Chinese population in Hong Kong. *HK Gynaecol Obstet Midwifery* 2013;13:74-80
4. Johnson N, Sandy J. Prenatal diagnosis of cleft lip and palate. *Cleft Palate Craniofac J* 2003;40:186-9
5. Tang PMY, Chung KLY , Leung YCL et al. Multidisciplinary Antenatal Counselling of Fetal Cleft Lip/Palate Deformity in a Single Centre: A Review of 62 Pregnant Women in Hong Kong. *HK J Paediatr* 2016;21;152-55
6. Chen PKT, Chang FCS, Chan FC et al. Repair of Tessier No.3 and No.4 Craniofacial Clefts with Facial Unit and Muscle Repositioning by Midface Rotation Advancement without Z-Plasties , *Plast Reconstr Surg.* 2012, 129(6) pp 1337-44 DOI:10.1097/PRS.0b013e31824cc310
7. Ross RB. Treatment variables affecting facial growth in complete unilateral cleft lip and palate. *Cleft Palate J.* 1987; 24: 5-77.
8. Watzke I, Turvey TA, Warren DW, Dalston R. Alternations in velopharyngeal function after maxillary advancement in cleft palate patients. *J. Oral Maxillofac. Surg.* 1990; 48: 685-9.
9. Okazaki K, Satoh K, Kato M, Iwanami M, Ohokubo F, Kobayashi K. Speech and velopharyngeal function following maxillary advancement in patients with cleft lip and palate. *Ann. Plast. Surg.* 1993; 30: 304-11.
10. Witzel MA. Speech evaluation and treatment. *Oral Maxillofac Surg Clinics North Am* 1991;3;501-16
11. Gart MS, Gosain AK. Surgical management of velopharyngeal insufficiency. *Clin Plast Surg.* 2014;41:253-70.
12. Padgett EC. The repair of cleft palates after unsuccessful operations with special reference to cases with an extensive loss of palatal tissue. *Int J Orthodontia Oral Surg Radiogr.* 1930;16:1299-316.
13. Hogan VM. A clarification of the surgical goals in cleft palate speech and the introduction of the lateral port control (l.p.c.) pharyngeal flap. *Cleft Palate J.* 1973;10:331-45.
14. Woo AS. Evidence-based medicine: cleft palate. *Plast Reconstr Surg.* 2017;139:191e-203e.
15. Swanson JW, Johnston JL et al, Perioperative Complications in Posterior Pharyngeal Flap Surgery: Review of the National Surgical Quality Improvement Program Pediatric (NSQIP-PEDS) Database, *Cleft Palate Craniofacial J.* 2016 Sep;53(5):562-7. doi: 10.1597/15-154. Epub 2015 Sep 24
16. Lexer E , Free transplantation . *Ann Surg* 1914, 60:166-194
17. Thompson N ,The subcutaneous dermis graft: a clinical and histologic study in man. *Plast Reconstr Surg* 1960, 26:1-22
18. Patel IA, Hall PN Free dermis-fat graft to correct the whistle deformity in patients with clef lip. *Br J Plast Surg* 2004, 57:160-164
19. Chow TK, Chow SK, Secondary cleft lip deformities soft tissue volume augmentation-our experience, Oral Abstract 11th World Cleft Lip/Palate Craniofacial Congress, Wuhan China 2017 pp87-88
20. Posnick JC, Dagys AP. Skeletal stability and relapse patterns after Le Fort I maxillary osteotomy fixed with miniplates. The unilateral cleft lip and palate deformity. *Plast. Reconstr. Surg.* 1994; 94: 924-32.
21. Saltaji H, Major MP et al, Maxillary Advancement with conventional orthognathic surgery in patients with cleft lip and palate: is it a stable technique? 2012; *J Oral Maxillofac Surg* 2012;70(12):2859-66
22. Adlam DM, Yau CK, Banks P. A retrospective study of the stability of midface osteotomies in cleft lip and palate patients. *Br. J. Oral Maxillofac. Surg.* 1989; 27: 265-76.
23. Luther F, Morris DO, Hart C Orthodontic preparation for orthognathic surgery: how long does it take and why? A retrospective study. *Br J Oral Maxillofac Surg* 2003;41: 401-6
24. Diaz PM, Garcia RG, Gias LN et al, Time used for orthodontic surgical treatment of dentofacial deformities in white patients. *J Oral Maxillofac Surg* 2010;68:88-92
25. Kim JH, Madhavia NN, Evans CA, Guidelines for "surgery first" orthodontic treatment. *Orthodontics-basic aspects and clinical considerations; Chpt 12, Prof Bourzgui(ed.)* 2012:265-301. <http://cdn.intechopen.com/pdfs-wm/31382.pdf> Accessed 30 August 2015.
26. Frost HM, The biology of fracture healing. An overview for clinicians. Part I. *Clin Orthop Relat Res* 1989;283-293
27. Frost HM, The biology of fracture healing. An overview for clinicians. Part II. *Clin Orthop Relat Res* 1989;294-309
28. Liou EJ, Chen PH et al. Surgery-first accelerated orthognathic surgery: postoperative rapid orthodontic tooth movement. *J Oral Maxillofac Surg* 2011;69:781-785
29. Chow TK, Kwan AKM, Lam A, Bimaxillary orthognathic surgery by "surgery first approach"- Analysis of peri-operative parameters, *Dent Oral Craniofac Res* 2017;4(2):2-6