AN AUDIT OF A SERVICE FOR REHABILITATION OF THE ADULT OPERATED UNI-LATERAL CLEFT LIP AND PALATE ADULT PATIENTS

Sunny S, MDS*
Joseph S, MDS**
Joseph V, MDS***

* Associate Professor, Department of Orthodontics, Babuji Dental College, Davanagere
** Professor, Department of Orthodontics, Oxford Dental College, Bangalore
*** Professor, Department of Plastic Surgery, St. John’s Medical College Hospital, Bangalore

INTRODUCTION:
The adult operated cleft lip and palate patient can pose a special challenge to the Oral Surgeon, Plastic surgeon and Orthodontist. A combination of Orthodontics, Orthognathic surgery, lip and nose revisions can favourably rehabilitate the occlusion and face. Ten patients with uni-lateral cleft lip and palate initially operated at various centres were treated at a service with the same protocol. A routine treatment protocol for orthodontics, maxillary advancement, and final nose and lip revision is assessed here. Results are presented.

AIMS AND OBJECTIVES:
1. To assess a service for facial and occlusal rehabilitation of adult operated uni-lateral cleft lip and palate patients.
2. To assess the orthodontic and surgical protocol for reproducible results.
3. To assess pre and post operative speech in these patients.
4. To list a protocol for rehabilitation of the cleft patient which is economically viable.
5. To audit the service to improve care.

MATERIALS AND METHODS:
10 adult cases previously operated for uni-lateral cleft lip and palate deformity reported for final corrections. Aesthetics was the main concern in all the patients. All patients went through pre-surgical orthodontics and maxillary advancement as the first phase. Lip and nasal revisions were done in the next phase. All patients initially reported to the Department of Plastic Surgery, St. John’s Medical College & Hospital, Bangalore. They were then referred to the orthodontic clinic for facial rehabilitation. All routine records were taken for the orthodontic assessment. The radiographs requested were OPG, Lateral cephalogram and Frontal cephalogram. Eminent authors suggest TWO SETS OF RECORDS TO BE TAKEN AT THE TIME OF INITIAL EXAMINATION. Loss of records in multiple discipline cases is common. Clinical photos and study models were taken. In view of any asymmetry and nasal corrections the Birds eye view was also taken.

COMMON CLINICAL FEATURES:
Extra-oral Examination:
Frontal view: Severe mid-face deformity with poor lip support. At rest and on smiling incisor visibility was poor.
Profile: Convex profile with, deformity of the nasal tip and dorsum.

Intra-oral Examination:
Teeth in the cleft region will be missing. Super numerary teeth may be present in the cleft area. Molar relation varying from Class-I to Class-III Reverse over jet ranging from of 8-12mm Upper arch is collapsed, with transverse and arch length and tooth material discrepancies. Lower arches are usually well aligned and need minimum orthodontics.
Patient 1

Pre-treatment extra oral views

Pre-treatment intra oral views

Fig. I

Post surgical extra oral views

Post surgical intra oral views

Fig. II
Extra oral views after final nose revision
Fig. III

Bird’s eye view
A. Pre treatment; B. Post maxillary advancement; C. Post final nose and lip revision
Fig. IV
**Lateral cephalogram**
A. Pre treatment;  
B. Pre surgical;  
C. Post surgical  
Fig. V

**OPG**
A. Pre surgical;  
B. Post surgical  
Fig. VI

**Occlusal view**
A. Pre treatment;  
B. Mid treatment;  
C. Post treatment  
Fig. VII
Patient 2

Pre treatment – Extra oral views

Pre treatment – Intra oral views

Post maxillary advancement surgery – Extra oral views

Post maxillary advancement surgery – Intra oral views

Fig. I

Fig. II
Extra oral views after nasal correction

Pre op birds eye view

Post op birds eye view

Fig. III

Lateral Cephalogram
A. Pre treatment; B. Pre surgical; C. Post surgical

Fig. VII

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Patient 3

Pre treatment — Extra oral views

Pre treatment — Intra oral views

Fig. I

Post maxillary advancement surgery — Extra oral views

Post maxillary advancement surgery — Intra oral views

Fig. II
**Lateral Cephalogram**

A. Pre treatment;

B. Pre surgical;

C. Post surgical

Fig. III

**OPG**

A. Pre surgical;

B. Post surgical

Fig. IV
Patient 4

Fig. I

Pre surgical — Extra oral views

Pre surgical — Intra oral views

Fig. II

Post maxillary advancement and rhinoplasty — Extra oral views

Post maxillary advancement — Intra oral views

Fig. II
Lateral Cephalogram

A. Pre treatment;

B. Pre surgical;

C. Post surgical

Fig. IV
The Orthodontic treatment protocol was as follows:

1. The Quad-helix appliance is used as the appliance of choice for the expansion of the upper arch. It permits differential expansion as well. Molar rotations can be corrected as well. All the teeth upto the 2nd molar are strapped with the .022"x.028" MBT appliance from 3M Unitek Levelling and aligning is the main orthodontic movements in the cleft arch. Segmental aligning is carried out where necessary. The triple molar tube permits this. TMA/CNA wires are used for aligning instead of Ni-Ti wires as they can be conformed to the arch form of the patient. The bite in these patients is responsible for many breakages. Sometimes even the pre-welded molar tube was broken. Posterior bite planes in the lower arch are useful. GI/composite bite blocks turn out to be too unpractical and uncomfortable.

2. Arch co-ordination for Class-III as per the MBT technique⁹. How ever in the Class-II maxilla, the maxillary arch is selected and the mandibular arch is maintained 3mm smaller.

3. Passive .019"x.025" wires are placed at least for two months before splint preparation and surgery.

4. The .019"x.025", wires are prepared with crimpable hooks (also soldered) to enable inter-maxillary fixation during surgery.

The torque expression of the MBT appliance facilitates the incisor position to be improved greatly with reduction in the reverse overjet (Patient 1 – Fig.V) & (Patient 2 – Fig.IV). Torque expression increases the arch length too.

This alters the original decision of a bi-jaw surgery to a single surgery in most cases.

A face bow transfer is done one month before surgery to assess the occlusion and minimize post surgical orthodontics. It is advisable to restrict the finishing and detailing stage to a minimum. The upper arch should always be in a rigid wire after all the initial corrections. The scar tissue in the maxilla favours quick relapse. A TPA is always useful to maintain transverse corrections.

A surgical splint was prepared for the surgery just prior to the surgery. The surgical technique is a Le-fort-I osteotomy (Fig.1). The cleft maxilla is difficult to operate. The surgeon prefers to use a splint routinely. Surgical plates are used for fixation. The surgical splint is kept for two weeks. In addition to the rigid fixation.
the patient is kept in IMF with elastics for fixation for a further six weeks. The patient is also on a liquid diet for six weeks. The maxilla in the cleft patient is very compromised, hence this consolidation phase seems necessary. Oral hygiene should be maintained strictly.

Though this seems rather regimental the post operative results are consistently stable. The minimum follow up in this regime is 24 months.

Post-surgically after eight weeks Orthodontic treatment is commenced. Facial swelling and discomfort does not permit this earlier. Finishing and detailing is done to the best possible manner. Smaller wire dimensions used routinely for finishing and detailing should be avoided in the maxillary arch. This takes eight weeks. At this juncture the final nasal and lip corrections are planned.

Nasal corrections are best done after maxillary advancement as the nose has a stable base to sit on. De-bonding is followed with permanent retention in the upper arch (Fig.2). This is followed by an augmentation rhinoplasty with a rib graft. Lip revisions are done when necessary. They are done to restore aesthetics and function as well (Fig.2 - a, b & c).
CRITICAL ANALYSIS OF THE STUDY:
The treatment time initially was long 2.5 to 3.5 years now we can reduce it by 6 months comfortably. Burn out with prolonged orthodontics is a major issue. Asymmetry issues were not addressed as suitable aesthetics was achieved. No speech problems were reported due to the maxillary advancement. Speech assessment pre and post surgical, should however be included as part of the protocol. It would be more beneficial to have all facilities for the patient under one roof.

RESULTS:
Incisor position remained stable in all cases reflecting success in the maxillary advancement procedure. The stable correction enabled lip revisions and rhinoplasty procedures to complement the previous corrections.

SUMMARY AND CONCLUSION:
Stable and cost effective results can be obtained for adults with cleft lip and palate deformity. The above protocol equips the individual to have a better quality of life.

REFERENCES:

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