

CORRECTION OF BIMAXILLARY DEFORMITY - A SURGICAL DILEMMA? PRELIMINARY REPORT OF EIGHT CASES.

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SYNOPSIS

Developmental deformities of the maxilla and mandible result in poor aesthetics and may handicap a person socially bringing about psychological and emotional problems. The various osteotomy techniques used in the eight cases are discussed. A preliminary report of the results are summarised, though a long term evaluation has to be ascertained of these cases.

INTRODUCTION

Facial deformities are divided into two basic groups as described by Walker:

- (a) Developmental produced by congenital damage to a growth centre, excessive function and hyperplastic or tumorous growth.
- (b) Acquired:- produced by trauma, surgical removal of a part or infection.

These deformities result in poor aesthetics, articulation deficiencies and grossly defective mastication pattern. Thus these deformities have to be corrected at an early opportunity to improve the personality of these unfortunate group of patients.

The surgical correction of jaw deformities was practised in Europe as early as the 19th Century by Jaboulay and Berard (1) according to Dufourmental (2). Kostectka (3) is credited as the originator of ramus osteotomy. Experiences with maxillo facial trauma surgery of Dingman and Harding (4) contributed to the development of total maxillary surgery. The ramus sagittal split procedure designed by Obwegeser (5), modified by Dal Pant (6) and Hansuck (7) is well known. With the advancement in anaesthesiology, surgery and orthodontics, bimaxillary surgical procedures were undertaken in one operation with satisfying results without endangering life.

MATERIALS AND METHODS

Eight patients with mandibular protrusion and maxillary retrusion were surgically corrected. Of these three were females and five males. There were one Indian, one Malay and the rest were Chinese.

Age group varied from 22 years to 31 years.

None of them gave a history of trauma and all noticed the abnormality to be gradual onset.

Their main complaints were:-

- (a) Aesthetically unacceptable and social embarrassment.
- (b) Difficulty of chewing as most of them had only one or two teeth contacts.

Though all of them thought their defect was in the lower jaw only, clinical observation, model study and cephalometric tracings showed four of them had maxillary retrusion and mandibular protrusion while the other four had relatively normal position of maxilla with protrusive mandible.

In these latter four patients, correction was done in the mandible only. Of these, one was corrected by the intra-oral

vertical sub sigmoid procedure and three cases were corrected via the intra-oral approach with a bilateral sagittal split osteotomy, bilateral oblique sub sigmoid osteotomy and a genio plasty respectively.

On four cases bimaxillary procedures were performed consisting of Le Fort I osteotomies in the upper jaw to advance the maxillae in all four cases and bilateral intra oral sagittal splits in three cases and in one case intra oral bilateral oblique sub sigmoid osteotomies to push back the mandible.

The procedures are summarised in Table I.

The surgical procedures were carried out under General Anaesthesia with endo tracheal intubation. The operative time for mandibular surgery alone was about two hours and for bimaxillary procedures with Le Fort I and Sagittal Split were about five and half hours. For Le Fort I and intra oral oblique sub sigmoid procedure four and half hours were adequate.

Iliac Crest bone or ribs were used to fill the space behind the maxillary tuberosity for Le Fort I osteotomy.

Blood loss in all cases, except one did not require blood transfusion although three units of blood were requested pre operatively in all bimaxillary procedures and two units in all mandibular procedures. In one case where bimaxillary procedure was performed, bleeding was profuse due to severance of a deep vessel which could not be located. This complication necessitated a tracheostomy and ligation of the external carotid on the side of bleeding.

All the bimaxillary surgical patients were observed in the intensive care unit for two post operative days and then transferred to oral surgical wards. Mandibular surgical patients went straight to oral surgical wards.

Inter maxillary fixation were carried out for 6-8 weeks using cast metal splint in the first three patients and arch bars in the latter five patients.

Table I Summary of osteotomies performed.

No	Patient	Sex	Age at operation	Osteotomies done
1	LAD	M	27	Le Fort I and intra oral bilateral sagittal splits
2	UT	F	31	Le Fort I and intra oral bilateral sagittal splits
3	CWE	M	27	Intra oral bilateral sagittal splits
4	SMA	F	21	Genioplasty
5	PKP	M	22	Extra oral bilateral vertical subsigmoid
6	PTC	M	24	Le Fort I and intra oral bilateral sagittal splits
7	CLT	M	23	Le Fort I and intra oral bilateral oblique subsigmoid
8	LKT	F	24	Intra oral bilateral oblique subsigmoid

RESULTS

In five of the eight patients the final result achieved were as planned pre surgically. In three cases some degree of relapse occurred just after the inter maxillary fixation were removed. These were in patients confined to mandibular push back procedures.

Pre and post operative cephalometric tracings are summarised in Table 2.

Figures 1 and 2 illustrates the pre and post operative photographs of the patient where the results obtained were as planned pre operatively. (Profile and Lateral views).

Figures 3 and 4 illustrates, the complex difference in appearance in pre and post operative views with a little hair made up. (Profile and Lateral views).

Table II Preoperative and postoperative cephalometric findings.

No.	Patient	SNA		SNB		Max		T Mand		MM <		LFH %	
		Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op
1	LAD	78°	81°	92°	84°	121°	120	68°	69°	28°	34°	65%	56%
2	UT	80°	84°	86°	86°	122°	121°	83°	83°	21°	18°	55%	55%
3	CWE	72°	72°	87°	84°	121°	121°	68°	68°	39°	38°	64%	59%
4	SMA	81°	81°	86°	85°	114°	115°	73°	74°	22°	21°	57%	54%
5	PKP	85°	85°	95°	86°	120°	121°	78°	79°	24°	29°	59%	59%
6	PTC	77°	79°	88°	83°	116°	115°	66°	69°	31°	35°	57%	57%
7	CLT	80°	83°	93°	84°	128°	130°	77°	75°	27°	26°	55%	55%
8	LKT	80°	80°	83°	79°	116°	116°	84°	83°	30°	31°	57%	57%

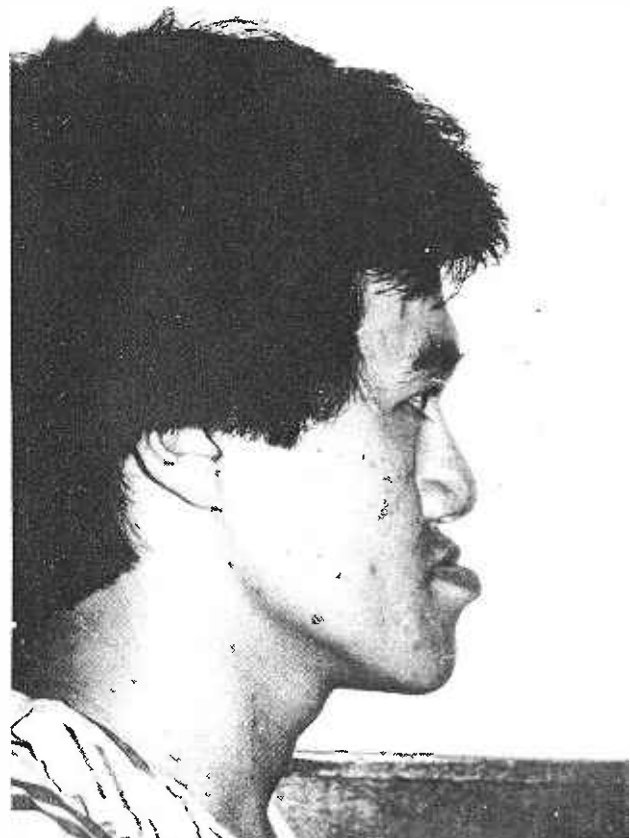
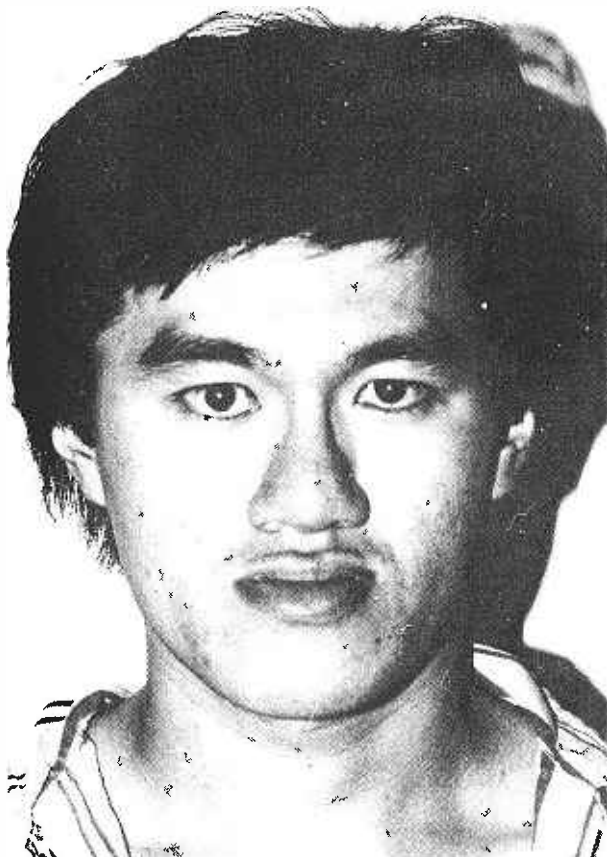


Figure 1 (a) and (b) Preoperative front and lateral views of patient CLT.



Figure 4 (a) and (b) Postoperative front and lateral views of the same patient.





Figure 3 (a) and (b) Preoperative front and lateral views of patient UT.



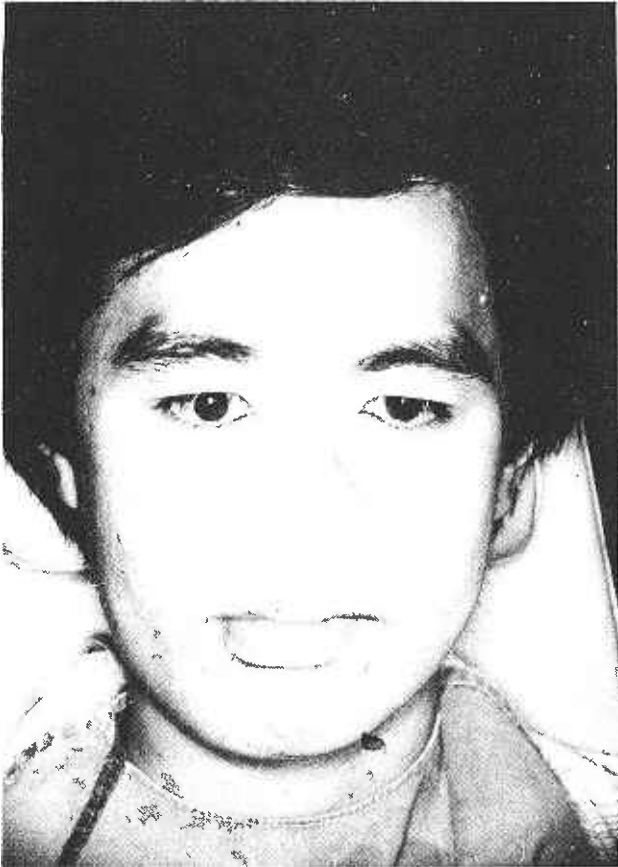


Figure 2 (a) and (b) Postoperative front and lateral views of the same patient.

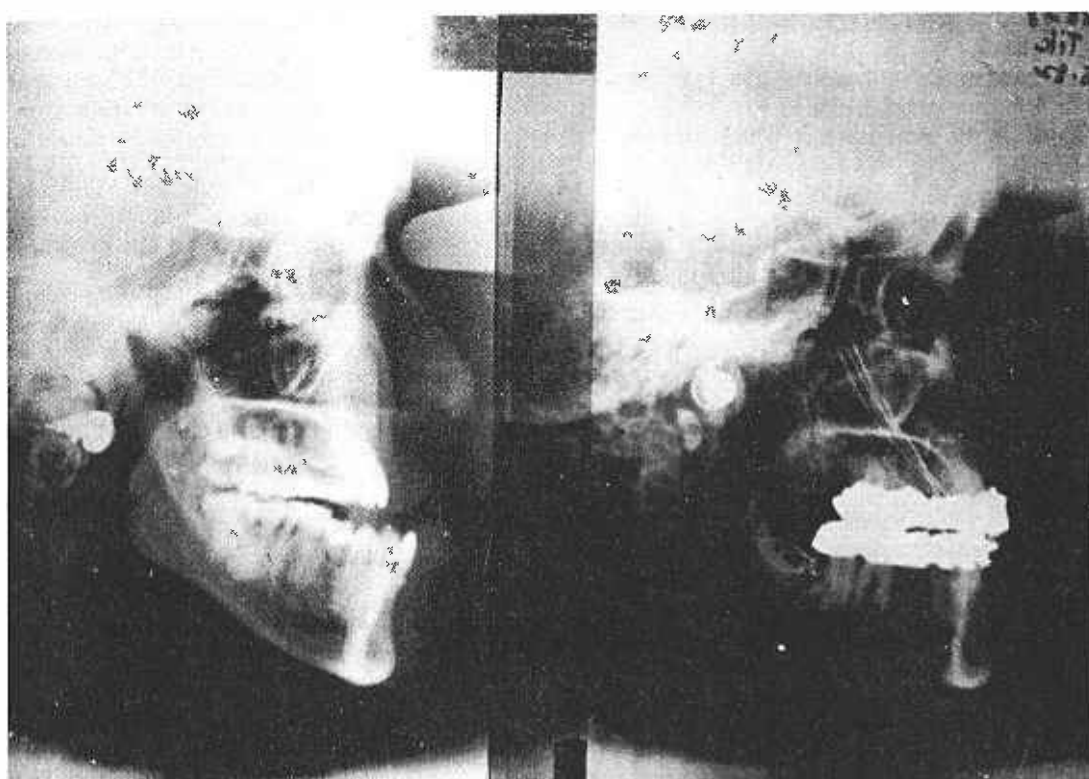


Figure 5 Illustrates the cephalometric radiograph of UT illustrating preoperative and postoperative views.

DISCUSSION

Majority of deformities of the facial skeleton are simple aberrations of growth, which usually become noticeable during adolescence growth period when all permanent teeth (except 3rd molars) have erupted. Although treatment may be planned with one or more of many primary goals, for example improvement of masticatory function or denture wearing, correction of speech defect or traumatic bite and even for alleviation of Temporomandibular joint myofascial arthralgia or a personality problem, but mainly the rationale is that of aesthetics.

In our experience pre operative preparation is crucial in achieving good post operative results. Plaster of Paris models of dentition, cephalometric studies and photographs are invaluable in arriving at a diagnosis and treatment planning. Though the relative defect appeared in mandible, after the preoperative studies, showed the defect also was in the retrusive position of the maxilla as well as the protrusive mandible.

Discussing the case with an orthodontist prior to surgery is mandatory for achieving good results.

Ensuring patency of the airway was very important post operatively. Admission to intensive care unit immediately after the surgery in bimaxillary procedures was a satisfactory arrangement.

To minimise post operative oedema in the neck region redivac suction drain were used in the mandibular osteotomy sites. In addition we prescribed an anti-inflammatory steroid, Dexamethazone 8 mg three times a day, on the day of operation and halved the dose each day. In one case a genioplasty was done without prescribing dexamethazone, post operative oedema was excessive. All patients were covered with an anaerobic antibiotic Metranidazole and ampicillin.

We find inter maxillary fixation with arch bars gave more exact occlusion compared to silver cap splints. This difference was essentially due to errors introduced when intervening material is placed inter occlusally during fixation.

Bone grafts were used in four cases where maxillae were moved forward more than 1 cm. In two patients, they were inserted into the space created between the posterior part of the maxilla and pterygoid plates and two cases in the anterior and lateral sides of the osteotomy cuts. Grafts were taken from the hips or rib depending on the surgeons preference. Grafts enhanced healing and minimised relapse.

Naso gastric tubes were introduced during surgery and feeding was aided by naso gastric tubes for two weeks. This helped the intra oral wound to heal easily without any infection.

Paraesthesia of the I.D. nerve distribution for more than two weeks was a post operative complication only in one patient who had bimaxillary correction.

Relapse is the most problematic issue in the surgical correction of Bimaxillary deformity. Many modification of treatment like overcorrection, sectioning of the pterygomasseteric sling, myotomy eg. anterior belly of digastic or prolonged immobilization for more than 6-8 weeks have all been attempted by various surgeons with varying success. Occlusal and aesthetic relapse were studied in detail by Mac Intosh (8) and his conclusion is that the essential impetus for relapse comes from a proprioceptive drive to re-establish the pre operative dento-oro-facial environment and that the site of most active proprioceptive stimulus is within the condylo-ramus masticatory muscle complex. In

patient CWE and PRP treated by bilateral ramus sagittal splint procedure in the lower jaws only, relapse occurred probably because the musculature could not accommodate such big push back.

Patient UT the new maxillary position was more stable but the mandible relapsed forwards as in the above two cases. These patients had relapsed to an edge to edge position of the incisors and they are as pleased with the result as the others. This is not surprising considering the pronounced deformity which it was possible to correct practically optionally in one single operation.

In our cases of Bimaxillary correction the ratio of advancement of the maxilla and push back of mandible was almost 1:1. The position of maxilla after surgery was more stable than mandible and the relapse of the maxilla was minimal. This is in accordance to Teuscher's and Sailer (9) view that in advancement without any additional procedure, the maxillary relapse is almost non-existent. On the other hand relapse of the mandibular push back is not more frequent or more marked than in other evaluations of selective prognathism operations of the Zurich clinic (10,11)

Karl Moser (12) concludes that a combination of both procedures contain no higher risks for the patient in respect of complications or relapse.

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