ORIGINAL ARTICLE

Orthognathic Surgery in the University of Malaya

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Summary

This is the first review on orthognathic surgery in Malaysia. The records of a total of 84 patients seen between 1977 and 1999 in the Department of Oral and Maxillofacial Surgery of the Faculty of Dentistry, University of Malaya were analysed. Skeletal III deformity formed 85% of the sample with a female dominance of 2 to 1. The patients' age ranged from 17 to 36 years, with a mean of 25.3 years. The common surgical techniques used were combined bilateral sagittal split and Le Fort I osteotomy. The predominant ethnic group was Chinese (n=58, 69%); followed by Malay (n=14, 17%) and Indian (n=12, 14%).

Key Words: Orthognathic surgery, Asian

Introduction

Orthognathic surgery refers to the surgical alignment of the jaws. It aims to normalise the relationship of the jaws between themselves and to the rest of the craniofacial complex[1].

In general, patients seeking treatment may present with dentofacial abnormality arising as a congenital defect, an inherited trait or following trauma[2]. It may involve only the dento-alveolar, the middle third or lower third of the facial skeleton or a combination of these. Such discrepancy may be of varying degrees and may arise in antero-posterior, vertical and/or transverse plane. The maxilla and mandible can be surgically sectioned and fixed anterior, posterior, lateral, superior or inferiorly to compensate these discrepancies[3].

Patients seek orthognathic surgery for the following reasons:

- Functional: to seek improvement in biting, chewing, speech and temporomandibular joint problems.
- Aesthetics:
  1. To correct an appearance which is outside social norms.
  2. Idolatry.
- Social: as an adverse response to a feature of their appearance.
- Advice of friends and family.
- Advice of dental & medical professionals.

We review in retrospect all the 84 orthognathic surgery cases performed since the establishment of the Faculty of Dentistry of the University of Malaya.

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Materials and Methods

In this study, a review was undertaken of all patients presenting for orthognathic surgery at the Department of Oral and Maxillofacial Surgery during the period from August 1977 to July 1999. Data for each patient were obtained from their medical records traced through the operating theatre log-book maintained by the Department of Oral and Maxillofacial Surgery. Data collected were categorised into:

a) Socio-demography of patients
b) Type of skeletal discrepancy; (Class I including facial asymmetry, Class II and Class III skeletal discrepancies); and
c) Type of operation (bilateral sagittal split , Le Fort I, genioplasty, Kole, Wunderer and subsigmoid operations)

Results

Between the period of August 1977 to July 1999, a total of 89 patients had undergone orthognathic surgery in the Department of Oral & Maxillofacial Surgery, Faculty of Dentistry of the University of Malaya. The first orthognathic surgery was carried out on 4th August 1977. Out of the 89 patients, only 84 records could be retrieved. Of the 84 patients, 53 patients (63%) were female and 31 patients (37%) were male. Figure 1 illustrates the pattern of distribution of female and male patient from 1977 to 1999.

The patients' ages ranged from 17 to 36 years, with a mean of 25.3 years (Figure 2).

The predominant ethnic group was the Chinese (69%), whereas the Malays and Indians constituted 17% and 14% respectively. Eighty-five percent (n = 71) of the patients were diagnosed to have skeletal III discrepancy (Figure 3). Skeletal II discrepancy accounted for 7% while skeletal I discrepancy which comprised of patients who suffered from vertical chin excess or mandibular asymmetry stood at 8% (n=7).

Table I shows the distribution of different types of osteotomies performed in term of gender distribution. There were 25 bimaxillary osteotomies (Bimax) and 41 bilateral mandibular sagittal split (BSSO). Bimaxillary osteotomy comprised of Le Fort I osteotomy and BSSO. Other less often performed procedures were 3 subsigmoid osteotomies, 6 Le Fort I down-fractures alone, 6 segmental osteotomies (Kole and Wunderer) and 3 cases of genioplasty alone. The spread out of different type of osteotomies in terms of ethnic group is shown in Figure 4.

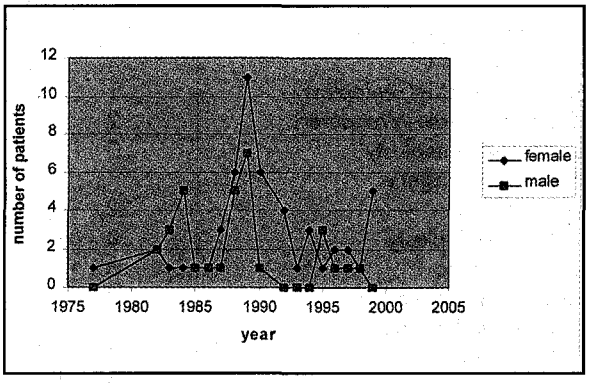

Fig. 1: The gender distribution in yearly spread out

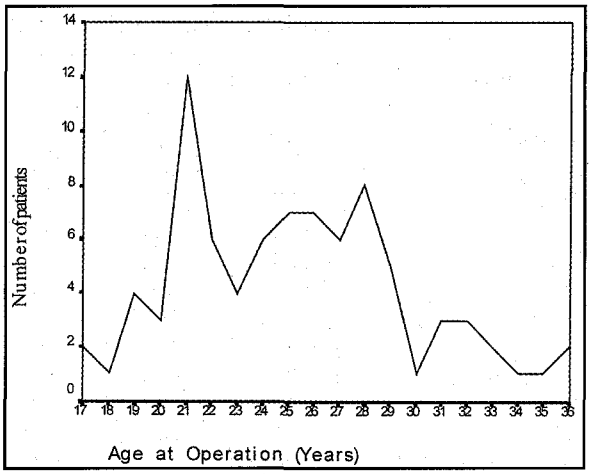

Fig. 2: The distribution of different ages at operation

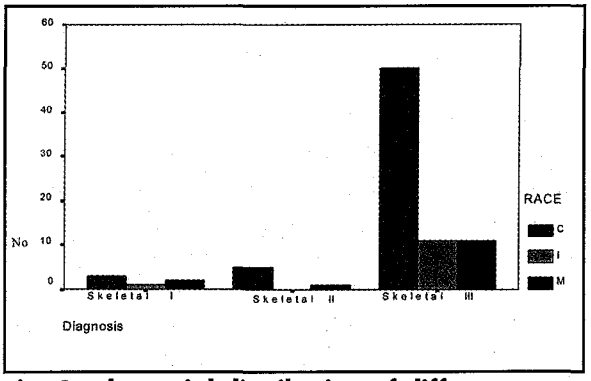

Fig. 3: The racial distribution of different types of skeletal discrepancies

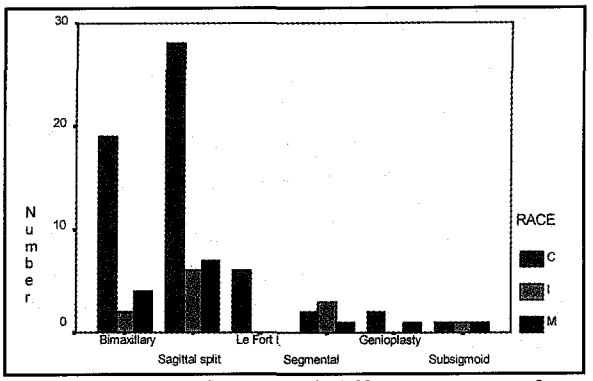

Fig. 4: The distribution of different types of osteotomies by ethnic group

Table I: The gender distribution among the different types of osteotomies

	Female		Male		Total	
Two-jaw surgery	No.	%	No.	%	No.	%
BSSO+Le Fort I	14	26	9	29	23	27
BSSO+Le Fort I+Genioplasty	1	2	1	3	2	2
Segmental (Kole+Wunderer)	2	4	1	3	3	4
Le Fort I+Genioplasty	0	0	1	3	1	1
Single jaw surgery						
BSSO alone	22	42	13	42	35	41
BSSO+Genioplasty	4	7	2	7	6	7
Le Fort I alone	4	7	1	3	5	6
Genioplasty alone	3	6	0	0	3	4
Segmental (Kole alone)	1	2	2	7	3	4
Subsigmoid alone	2	4	1	3	3	4
Total	**53**	**100**	**31**	**100**	**84**	**100**

BSSO = Bimaxillary sagittal split osteotomy

Table II: Distribution by gender and age in other studies

First author	Year	Country	No.	Female (No.)	Male (No.)	Age range (year)	Mean age (year)
Hutton	1967	USA	32	21	11	13 - 38	NA
Pepersack	1978	Sweden	67	37	30	15 - 37	NA
Ouellette	1978	USA	66	51	15	12 - 42	26
Olson	1980	USA	52	36	16	16 - 65	26
Tomizawa	1981	Japan	41	23	18	13 - 33	19
Kiyak	1982	USA	74	48	26	12 - 47	23
Jacobson	1984	USA	50	34	16	NA	NA
Flanary	1985	USA	90	66	24	14 - 60	24
Nagamine	1986	Japan	65	40	25	13 - 31	20
Garvill	1992	Sweden	27	17	10	17 - 56	28
Finlay	1995	UK	61	37	24	18 - 60	NA
Cunningham	1996	UK	49	34	15	NA	32
Nurminen	1999	Finland	28	19	9	18 - 46	31

NA= Not Available

Table III: Distribution by gender and age in other studies

First author	Year	Country	No.	Class III skeletal %	Class II skeletal %	Class I (mandibular asymmetry, vertical chin or maxilla excess) (%)
Ouellette	1978	USA	56	33	34	23
Olson	1980	USA	52	48	25	14
Tomizawa	1981	Japan	41	100	-	-
Nagamine	1986	Japan	65	100	-	-
Garvill	1992	Sweden	27	52	41	7
Nurminen	1999	Finland	28	39	46	NA

NA= Not Available

Discussion

There were only 89 cases of orthognathic surgery being performed over a period of 22 years. This number is very small as compared to overseas studies.

A few reasons that may explain for the small number of cases are as the followings:

1. Fear of gossip and being branded vain still makes cosmetic surgery not totally acceptable to the Malaysian society;
2. Due to the socio-cultural difference, Malaysians generally tend to refuse surgical intervention except for life threatening situations. The significant others' unsupportive reaction could come from:
   - Fear for the patient's safety
   - Inability to see the need for treatment
   - Economic factors
   - Moral or religious reasons
   - Insensitivity to the patient's feelings about his or her dento-facial problem
   - Resentment that a specific facial feature should be regarded as objectionable (e.g. family characteristic) and
   - Fear of losing affection or companionship (because the improvement in appearance may arouse the interest of others).
3. Orthognathic surgery is considered as a treatment of choice only for those patients in whom other treatment options would compromise the result[4,5]. As most of the patients were referred to the Department of Oral & Maxillofacial Surgery by orthodontists, some patients might not be informed about the surgical modality and instead opt for dental compensation orthodontically.

Society's growing acceptance of male narcissism has increased the prevalence of cosmetic surgery among men[6]. However, the frequency of male orthognathic surgery candidates did not linearly increase over the last few years (Figure 1). The current result still shows the past trend of twice as many females than males in orthognathic surgery. This finding is comparable to those reported by Hutton[7], Olson and Laskin[8], Woon[9], Cunningham *et al.*[10], Steenbergen *et al.*[11] and Nurminen *et al*[3] (Table II).

The present study does not have patients older than 36 years old. This compares well with the 2 Japanese studies which reported their eldest patients to be in their early thirties[2,12]. It is however quite different from other studies in which their patients were up to 60 years old[13]. This shows that the Asians accepted their dentofacial discrepancy after the average age of marriage; that is after thirty years old. This may be due to differences in the Western and Eastern culture.

There is a high prevalence of Class III malocclusions. As the samples are predominantly Chinese (69%), this concurs with the results of dental occlusion studies in the Chinese, Malays and Indians by Woon *et al*[14]. They reported that both the Chinese and Malays had more Class III malocclusions than the Caucasians (Table III), American Negros and Indians[9,14,15]. The high incidence of Skeletal III jaw relationship in the Malaysian Chinese was due to the forward position of the mandible as compared to the other races and the shorter sella-nasion length in the Chinese[16,17].

Chinese and Malays have more Class III malocclusions than Indian[14]. However, an interesting finding is that even among the Indian patients, orthognathic surgery for Class III malocclusion was still predominant. It suggests that this feature is relatively unacceptable within the Malaysian population and thus prompts many patients to seek treatment. It is believed that prognathic mandible is aesthetically more disturbing than a retrognathic mandible; patients with mandibular deficiency can 'improve' their facial appearance by posturing the mandible forward but the reverse cannot be done in patients with prognathic mandible[5].

The incidence of maxillary protrusion only represents 14% of this sample. Wilmot *et al.* reported that patients with severe skeletal Class II deformities had higher motivation for orthodontics than surgery[18]. Perhaps the above fact helps to support this clinical situation. Many patients of Class II malocclusion would go for orthodontic camouflage rather than surgery[19,20]. Wilmot *et al.* also mentioned that most patients would prefer the least invasive treatment that might address their concerns[18]. This implies that Class II malocclusion is relatively within the acceptable limit in the population. On top of this, many orthodontists may not focus on the skeletal component of mandibular deficiency or consider it severe enough to warrant treatment; thus many patients with Class II malocclusions may never receive a surgical consultation or have this treatment alternative discussed as a viable option[20].

The low frequency and lack of severity of most complications has made surgical treatment a much more variable option for treatment of jaw discrepancies[20]. The media in recent years too having emphasised on physical beauty and setting standards higher, has become an important factor responsible for the increasing demand for orthognathic surgery[21]. Unpublished data from this centre suggested that 94% of the patients stated an overall satisfied with the results. There was 100% satisfaction with aesthetic improvement. Satisfaction with functional improvement was 68% of the surveyed population. Such a high satisfaction rate indicates that orthognathic surgery is not merely a form of aesthetic surgery, but an important procedure for those with severe malocclusions that cannot be satisfactorily treated by orthodontic means alone[22].

Conclusion

Female patients tended to seek orthognathic surgery more often than male. The most prevailing and unacceptable skeletal deformity in Malaysia was Class III skeletal deformity which forms 85% of the patients in this study. Le Fort I and Bilateral Sagittal Split ostetomy were the more common procedure performed.

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