



Prevalence of outflow of patients for esthetic rehabilitation through the maxillofacial surgical procedure - A retrospective study

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ABSTRACT

Dental esthetics is a field of dentistry concerned especially with the appearance of dentition as achieved through its arrangement, form and color. The type of malocclusion, the degree of malocclusion, age, patients' esthetic desires, practitioners' style of treatment as well as gender predilection can influence the final esthetic treatment the patient will be subjected to. From functional demands, over the years, patients' demands have dynamically shifted to meeting the maximum esthetics possible. In older patients, it is difficult to treat the malocclusion by orthodontic procedures, hence bringing in the requirement of performing surgical treatment along with prosthetic rehabilitation. This will help maximize esthetics as well as provide a long term, sustainable solution for the patient. The aim of the study was to determine the prevalence of outflow of patients undergoing jaw-related surgery requiring prosthetic rehabilitation and its association with esthetic demand. A sample size of 1743 patients' information from SDC DIAS database of Saveetha Dental College was taken and a retrospective study was performed where the data collection was done using Microsoft Excel Spreadsheet and data analysis was done using SPSS version 20.0 software. It can be said that surgical treatment is done majorly due to esthetic desires. There is no significant association of the requirement of the treatment with age as well as the gender of the patient ($P > 0.05$). There is a statistically significant association between Requirement of Prosthetic Rehabilitation and Age group ($P < 0.05$).

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INTRODUCTION

Dental esthetics is a field of dentistry concerned especially with the appearance of dentition as achieved through its arrangement, form and color. This does not just cover the complete dentition and also aims at the beautification of the smile as a whole. The importance of dentofacial appeal in regard to the individual's psycho-social well-being is a proven fact. One of the most important factors that affect people's smiles is teeth. A dental restoration's positive impact on the patient's smile, appearance, self-confidence and overall mental health cannot be

underestimated. Dental aesthetic corrections can be categorized into facial esthetics, esthetic orthodontics and esthetic prosthodontics. The type of malocclusion, the degree of malocclusion, age, patients' esthetic desires, practitioners' style of treatment as well as gender predilection can influence the final esthetic treatment the patient will be subjected to.

Malocclusion can be defined as an abnormal alignment of upper and lower teeth. A malocclusion can be either minor or severe in nature. For such minor malocclusion, orthodontic treatment without surgery can be advised. In cases of severe malocclusions, surgical treatment might have to be performed. In certain cases, surgery, along with orthodontics, might still not be the solution with maximum esthetics (Ganapathy, 2016; Ajay *et al.*, 2017). At one point of time, esthetic dentistry was a speciality for an orthodontist. But in current times, an oral maxillofacial surgeon and prosthodontist can be considered estheticians (Turvey, 1988; Ashok *et al.*, 2014). A prosthodontist is responsible for the final outcome and hence uses a single system of implant components to maximize the outcome (Duraishamy *et al.*, 2019; Ganapathy, 2016).

In the past world, functional demands were the main and sole focus of dental treatments. With time and technological advancements in dentistry, the main focus of demands had shifted to giving the patient the maximum esthetic values (Samorodnitzky-Naveh *et al.*, 2007; Akarlsan *et al.*, 2009). Dental aesthetics itself can be appreciated in cases of good oral hygiene (Basha *et al.*, 2018), a well-designed prosthesis (Venugopalan *et al.*, 2014; Kannan and Venugopalan, 2018) and even in treatment using ceramic restorations (Ashok and Suvitha, 2016; Kannan and Venugopalan, 2018). Acceptance of dental aesthetics varies from person to person based on the age of the patient (Ranganathan *et al.*, 2017), the gender of the patient, recognition of tooth color of the patient (Johnston, 1999; Khan and Kazmi, 2019; Jayalakshmi *et al.*, 2013), retained primary teeth (Robinson and Chan, 2009; Bjerklin, 2000) as well as the correlation of facial and dental midlines. To bring about the desired level of esthetics, interdisciplinary management is necessary (Yokoo, 2006; Ashok and Suvitha, 2016; Kannan and Venugopalan, 2018).

In an institutional setup such as Saveetha Dental College, there are several types of studies conducted such as in vitro studies (Vijayalakshmi and Ganapathy, 2016), reviews (Jain *et al.*, 2019; Selvan and Ganapathy, 2016), case reports (Jyothi *et al.*, 2017; Subasree *et al.*, 2016).

The aim of the study was to determine the prevalence of outflow of patients undergoing jaw-related surgery requiring prosthetic rehabilitation and its association with esthetic demand.

MATERIALS AND METHODS

A retrospective study was conducted in an institutional set up in Chennai using a dental information archiving software database over the duration from June 2019 till March 2020 over the past 8 months with a sample size of 86,000 patients of which 1743 patients who reported to the institution's Out Patient ward were selected. The cases selected for this study were selected by choosing the cases which require orthognathic surgery. The surgeries which are included in the sample size are orthognathic surgery, surgery for tooth exposure for orthodontic treatment, distraction osteogenesis, implant placement surgery and reconstructive surgery.

The study was conducted in a universal setting in a South Indian population. The positives of the study conducted were the similar ethnicity of the sample size of the study as well as the online availability of the database. This study was approved by the Ethical Board of the University. The Ethical number provided for this study was SDC/SIHEC/2020/DIASDATA/0619-0320. There were 2 reviewers involved in the data collection process.

The case sheets of the given sample size of the study were reviewed by the usage of intraoral photos of the patients. Cross verification of the patient's data is performed to prevent errors. The measure to prevent errors done was to review the observer, which will minimize the sampling bias.

The cases selected for this study were selected by choosing the cases which require orthognathic surgery. The surgeries which are included in the sample size are orthognathic surgery, surgery for tooth exposure for orthodontic treatment, distraction osteogenesis, implant placement surgery and reconstructive surgery. Patients below the ages of 18years were excluded from the study.

The internal validity of the study is applicable. The external validity of the study defines the eligibility criteria of the sample size population.

The data were tabulated using the Microsoft Excel Spreadsheet and analysis of the data was performed using IBM SPSS version 20.0 software where chi-square analytical tests were done.

RESULTS AND DISCUSSION

In a sample size of 1743 patients, there are quite a few variables to be related. The following study's data was collected from the patient details uploaded onto Saveetha Dental College Database. Using 2 reviewers, the data was collected and tabulated to give details regarding the patients' gender, age, the treatment they are advised to undergo, the purpose of the orthognathic surgery (function or esthetic).

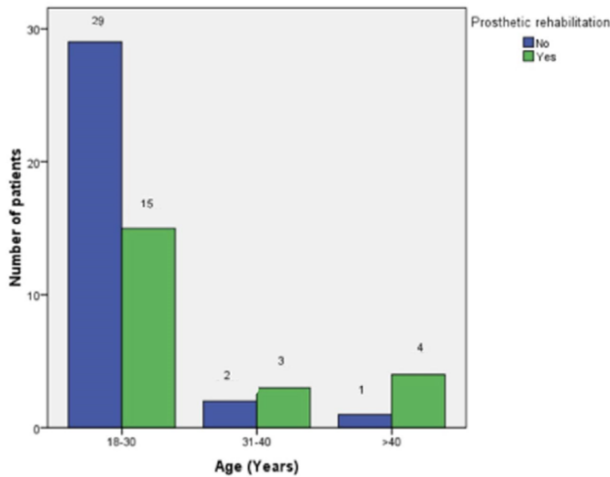


Figure 1: The above-depicted graph represents the association between the Requirement of Prosthetic Rehabilitation after jaw surgical procedure and Age group.

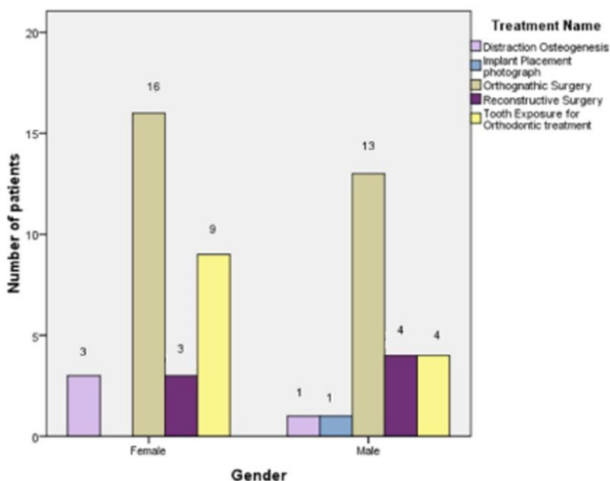


Figure 2: The bar graph indicates the association between the patient undergoing different types of surgery and gender.

Using IBM SPSS version 20.0 software, the data collected were subjected to chi-square tests to understand the correlation between all the variables in the study conducted.

In a sample size of 1743 patients, 3% require orthognathic surgery. The gender predilection was

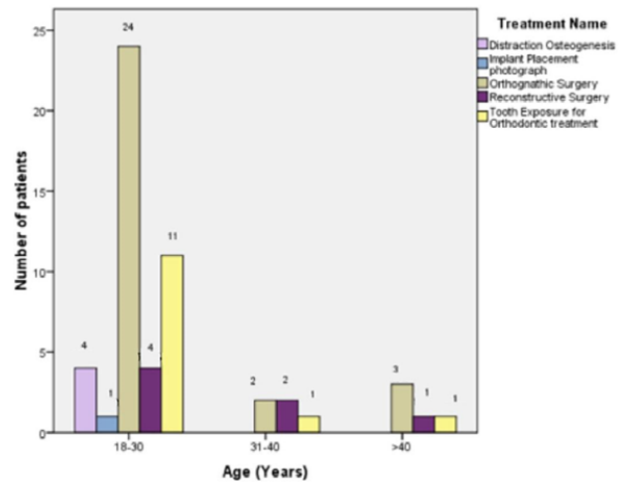


Figure 3: The bar graph represents the association between treatment and age group.

found to be 57% of females and 43% are males. Of all the sample sizes, orthognathic surgery indicated patients, 59.7% of the cases were in sole requirement of esthetic demands, that is an orthodontic treatment followed up after the orthognathic surgery.

The distribution of the orthognathic patients according to the age groups are as follows :

1. Children below 18 years - 25.9%
2. Young age (18 - 30 years) - 55.5%
3. Middle age (30- 40 years) - 9.4%
4. Older age (40 years above) - 9.2%

In patients within the 18 to 30 years age group, the 34.1% of the patients require prosthetic rehabilitation, while in the 30-40 years age group and above 40 years age group, the majority of the patients require prosthetic rehabilitation treatment to be done by a huge percentage (31-40: 60%; above 40: 80%) (Figure 1, Table 1). When the sample size was categorised based on the gender of the patients, it was observed that in males, there is an almost equal requirement of prosthetic rehabilitation and no treatment with a marginal difference in requirement of prosthetic rehabilitation (43.5%). In females, there is 38.7% showing the requirement of prosthetic rehabilitation. There is no significant association between Requirement of prosthetic rehabilitation and age as well as gender is seen (Figure 1, Table 1). Parsons' chi-square value = 4.766 ; P-value = 0.001 (p<0.05). There is a statistically significant association between Requirement of Prosthetic Rehabilitation and Age group.

Table 1: Relation between Requirement of Prosthetic Rehabilitation and Age group, Gender for patients after surgical approach.

		Prosthetic No	Rehabilitation Yes	Chi-square Value	P-value
Age	18-30 yrs	65.9%	34.1%	4.766	0.001
	30-40 yrs	40%	60%		
	Above 40 yrs	20%	80%		
Gender	Male	56.5%	43.5%	0.124	0.7
	Female	61.3%	38.7%		

Table 2: The above table shows the association between patients with esthetic or functional demand based on gender, age

		Esthetic	Esthetic + Function	Function	Statistical Tests
Age	18-30	4.5%	75%	20.5%	Chi square = 3.263 P=0.515
	31-40	0	60%	40%	
	Above 40	21%	60%	19%	
Gender	Females	6.5%	77.4%	16.1%	Chi square = 2.214 P=0.529
	Males	4.3%	65.3%	30.4%	

Within the female gender population, orthognathic surgery (16 participants) is the highest prevalent surgical treatment modality required followed by tooth exposure for orthodontic treatment (9 participants), reconstructive surgery (3 participants) and distraction osteogenesis (3 participants). Within male gender population, orthognathic surgery (13 participants) is the highest prevalent surgical treatment modality required followed by tooth exposure for orthodontic treatment (4 participants), reconstructive surgery (4 participants), implant placement surgery (1 participant) and distraction osteogenesis (1 participant) (Figure 2). Pearson's chi-square value = 3.263 ; P-value =0.515 ($p>0.05$). There is no statistically significant association between gender and type of surgery

Within all 3 age groups, it can be seen that orthognathic surgery is the highest treatment needed. In 18-30 years age group, tooth exposure for orthodontic treatment is the second-highest, followed by reconstructive surgery and distraction osteogenesis. In 31-40 years age group, reconstructive surgery is second highest followed by tooth exposure for orthodontic treatment. In the age group of patients above 40 years, reconstructive surgery and tooth exposure for orthodontic treatment can be seen in equal proportions (Figure 3). Pearson's chi-square value = 4.958 ; P-value= 0.762 ($p>0.05$). There is no significant association between surgical treatment and age group.

In the age group of 18-30 years, it can be found

that the majority of the surgical requirements are for esthetic and functional demands (75%) and 4.5 % is esthetic alone and between the 31-40 years age group, there is a demand for treatment satisfying both esthetic and functional demands of the patient. Above 40 years, it can be noticed that there is a huge amount of requirement of functional and esthetic demands in the surgical treatment performed and only 19% of cases are for functional demand. It can be concluded that esthetic demands play an important role in the treatment accepted and undertaken by the patients. There is no significant association of the requirement of the treatment with age as well as the gender of the patient (Table 2).

In Jain *et al.* (2014) study, the statistics showed that the majority of orthognathic cases undergo either orthodontic treatment or a mixture of orthodontic and prosthodontic treatments. In Bencharit *et al.* (2012), the study showed that comprehensive treatment, including orthognathic surgery, implant placement and prosthodontics could provide good results. Similar to a study conducted, Yokoo (2006) showed that early surgery for jaw fractures is best when occlusion is a major concern.

This study conducted shows the patient's demand shift towards esthetics. It also shows the surgical treatment can be a barrier for the esthetic outcome, patient demand towards esthetic in Indian scenarios. This study has one particular limitation prominently visible; that is, there are chances that the patient wasn't interested in orthognathic surgery.

Hence the treatment could be mentioned according to the patient's desire for treatment modality. To avoid this, maximum verification of the record of data was done based on the diagnosis.

This study explains to practitioners the importance of early detection and elimination of malocclusion by implication of sophisticated techniques in clinical practice and also showed the esthetic demand in Indian scenario without bothering surgical barriers.

CONCLUSION

Esthetics play a vital role as the demand is becoming higher and higher; patients are ready for a surgical approach for esthetic corrections. The female demand for surgical treatment is esthetically oriented and the majority of the population across all age groups undergo treatment with esthetic and functional demands. Being dentists, we must concentrate not only function but mainly esthetic according to patient demands.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

REFERENCES

- Ajay, R., Suma, K., Ali, S. A., Sivakumar, J. S. K., Rakshagan, V., Devaki, V., Divya, K. 2017. Effect of surface modifications on the retention of cement-retained implant crowns under fatigue loads: An In vitro study. *Journal of Pharmacy And Bioallied Sciences*, 9(5):154.
- Akarlsan, Z. Z., Sadik, B., Erten, H., Karabulut, E. 2009. Dental esthetic satisfaction, received and desired dental treatments for improvement of esthetics. *Indian Journal of Dental Research*, 20(2):195-200.
- Ashok, V., Nallaswamy, D., Begum, S. B., Nesappan, T. 2014. Lip Bumper Prosthesis for an Acromegaly Patient: A Clinical Report. *The Journal of Indian Prosthodontic Society*, 14(S1):279-282.
- Ashok, V., Suvitha, S. 2016. Awareness of all ceramic restoration in rural population. *Research Journal of Pharmacy and Technology*, 9(10):1691.
- Basha, F. Y. S., Ganapathy, D., Venugopalan, S. 2018. Oral Hygiene Status among Pregnant Women. *Research Journal of Pharmacy and Technology*, 11(7):3099-3102.
- Bencharit, S., Misiek, D. J., Simon, L. A., Malone-Trahey, A. 2012. Full Mouth Rehabilitation With Dental Implants for a Patient With Skeletal Class III Malocclusion: A Case Report. *Journal of Oral Implantology*, 38(1):63-70.
- Bjerklin, K. 2000. The long-term survival of lower second primary molars in subjects with agenesis of the premolars. *The European Journal of Orthodontics*, 22(3):245-255.
- Duraisamy, R., Krishnan, C. S., Ramasubramanian, H., Sampathkumar, J., Mariappan, S., Sivaprakasam, A. N. 2019. Compatibility of Nonoriginal Abutments With Implants. *Implant Dentistry*, 28(3):289-295.
- Ganapathy, D. 2016. Effect of Resin Bonded Luting Agents Influencing Marginal Discrepancy in All-Ceramic Complete Veneer Crowns. *Journal of clinical and diagnostic research*, 10(12):67-70.
- Jain, A. R., Bhagat, M. J. A., Nallaswamy, D., Narayanan, V., Ariga, P. 2014. Prosthognathic rehabilitation of a patient with underlying skeletal discrepancy- a case report. *Journal of Clinical and Diagnostic Research : JCDR*, 8(3):269-271.
- Jain, A. R., Nallaswamy, D., Ariga, P. 2019. Determination of Correlation of Width of Maxillary Anterior Teeth with Extraoral Factor (Interpupillary Width) in Indian Population. *Journal of clinical and diagnostic research*, 13(7):10-17.
- Jayalakshmi, N. S., Ravindra, S., Nagaraj, K. R., Rupesh, P. L., Harshavardhan, M. P. 2013. Acceptable Deviation between Facial and Dental Midlines in Dentate Population. *The Journal of Indian Prosthodontic Society*, 13(4):473-477.
- Johnston, C. 1999. The influence of dental to facial midline discrepancies on dental attractiveness ratings. *The European Journal of Orthodontics*, 21(5):517-522.
- Jyothi, S., Robin, P. K., Ganapathy, D., Anandisivaraj 2017. Periodontal Health Status of Three Different Groups Wearing Temporary Partial Denture. *Research Journal of Pharmacy and Technology*, 10(12):4339.
- Kannan, A., Venugopalan, S. 2018. A systematic review on the effect of use of impregnated retraction cords on gingiva. *Research Journal of Pharmacy and Technology*, 11(5):2121.
- Khan, M., Kazmi, S. 2019. The coincidence of Dental Midline with Facial Midline in a Sample of Pakistani Population. *Journal of the College of Physi-*

- cians and Surgeons Pakistan*, 29(3):210–213.
- Ranganathan, H., Ganapathy, D., Jain, A. 2017. A cervical and incisal marginal discrepancy in ceramic laminate veneering materials: A SEM analysis. *Contemporary Clinical Dentistry*, 8(2):272.
- Robinson, S., Chan, M. F. W.-Y. 2009. New teeth from old: treatment options for retained primary teeth. *British Dental Journal*, 207(7):315–320.
- Samorodnitzky-Naveh, G. R., Geiger, S. B., Levin, L. 2007. Patients' satisfaction with dental esthetics. *The Journal of the American Dental Association*, 138(6):805–808.
- Selvan, S. R., Ganapathy, D. 2016. Efficacy of fifth generation cephalosporins against methicillin-resistant *Staphylococcus aureus*-A review. *Research Journal of Pharmacy and Technology*, 9(10):1815.
- Subasree, S., Murthykumar, K., Dhanraj 2016. Effect of Aloe Vera in Oral Health-A Review. *Research Journal of Pharmacy and Technology*, 9(5):609–609.
- Turvey, T. A. 1988. Orthognathic surgery: a significant contribution to facial and dental esthetics. *The Journal of the American Dental Association*, 117(4):49–55.
- Venugopalan, S., Ariga, P., Aggarwal, P., Viswanath, A. 2014. Magnetically retained silicone facial prosthesis. *Nigerian Journal of Clinical Practice*, 17(2):260.
- Vijayalakshmi, B., Ganapathy, D. 2016. Medical management of cellulitis. *Research Journal of Pharmacy and Technology*, 9(11):2067.
- Yokoo, S. 2006. Orthognathic surgery for occlusal reconstruction of old malunited jaw fracture. *The Kobe journal of medical sciences*, 52(3-4):37–47.