

A RETROSPECTIVE STUDY ASSESSING THE PREVALENCE OF PATIENTS UNDERGOING SINGLE JAW AND BIJAW SURGERY IN DIFFERENT MALOCCLUSION CASES IN A PRIVATE DENTAL HOSPITAL IN CHENNAI

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ABSTRACT

Introduction: Orthognathic surgery is a unique attempt in face surgery since it can greatly improve a patient's look and occlusal function, affecting the patient's feeling of self and well-being. Orthognathic surgery has long been utilised to treat occlusion, but it is now also being used to treat individuals with obstructive sleep apnea (OSA). The surgery's primary goals are to provide class I occlusion, facial balancing, and/or enhanced airway space. As a result, the purpose of this study is to determine the number of patients who have single jaw and bijaw surgery among different malocclusion instances that are reported to a private dental institution in Chennai.

Materials and method: Between June 2019 and June 2021, a retrospective cross sectional study was conducted, and case records of patients undergoing single jaw and bijaw surgery were acquired by reviewing patient records and evaluating patient data. Using the SPSS software, the acquired data was subjected to a Chi square test for statistical analysis and correlation.

Results: This study documents that patients with skeletal Class I accounted for the largest percentage (58.6%) in the study group. Bijaw surgeries had a slight predominance and patients aged 20–30 were the most numerous group amongst those who sought treatment.

Conclusion: To properly create and implement a comprehensive treatment plan with predictable outcomes, a coordinated approach between the orthodontist and maxillofacial surgeon is required.

Keywords: Aesthetics; innovative study; malocclusion; novel method; orthognathic surgery.

INTRODUCTION

During infancy, adolescence, and early adulthood, there has been a rise in concern about dental aesthetics. In today's society, good dental health is associated with success in a range of endeavours. Often, cultural influences dictate what constitutes an acceptable, normal, and appealing physical look. (1) The difficulties observed are mostly due to the fact that malocclusion is a morphological variation that might be associated with pathological illnesses or not. Malocclusion is an occlusion in which the arches are misaligned in any plane or there are irregularities in tooth location, number, form, and developmental position of teeth that are beyond normal limits. Malocclusion can be induced by hereditary, environmental, or a mix of the two factors, as well as local factors such as poor oral hygiene. (2)

People with malocclusion may acquire a sense of shame about their dental look, become shy in social circumstances, or lose job chances as a result. In terms of discomfort, quality of life, and social and functional constraints, malocclusion has a significant influence on both individuals and society. Malocclusion is more common in some countries than others, and it varies by age and gender. It has been demonstrated to have an impact on periodontal health, increase the occurrence of dental cavities, and create TMJ issues. (1)

The desire to appear attractive, one's perception of one's own dental appearance, self-esteem, gender, age, and peer-group norms all influence the decision to pursue orthodontic treatment. Physical function improvement, tissue damage prevention, and cosmetic component correction are all significant benefits of orthodontic therapy. (3–6)

Orthognathic surgery is a unique attempt in face surgery since it can greatly improve a patient's look and occlusal function, affecting the patient's feeling of self and well-being. Close coordination between the surgeon and the orthodontist is essential for successful outcomes in modern orthognathic surgery, from preoperative planning to occlusion finalisation. (7,8)

Orthognathic surgery to relocate the maxilla, mandible, or chin is the cornerstone treatment for patients who are too old for growth modification and who have dentofacial deformities that are too severe for surgical or orthodontic masking.

In today's orthognathic surgical treatment for dentofacial deformity, standard orthognathic therapies to fix jaw distortion, as well as adjuvant surgeries to restore hard and soft tissue shapes, are used. Adjuvant procedures include osseous versus alloplastic genioplasty, septorhinoplasty, and neck suction lipectomy. (9,10)

A coordinated approach between the orthodontist and maxillofacial surgeon is necessary to appropriately establish and implement a thorough treatment plan with predictable outcomes.

Orthognathic surgeries are increasingly being prescribed to treat malocclusions involving a considerable skeletal component. Furthermore, orthognathic outcomes are becoming more predictable, morbidity is decreasing, and inpatient stays are decreasing; intermaxillary fixation has mostly been replaced by rigid internal fixation, allowing for a faster recovery of masticatory function. (11)Orthodontic operations are generally well received, and considerable improvements in oral health-related quality of life are common. (12,13)

Our team has extensive knowledge and research experience that has translate into high quality publications (14–33)

Hence the aim of this study is to assess the prevalence of patients undergoing single jaw and bijaw surgery in different malocclusion cases reporting to a private dental hospital in Chennai.

MATERIALS AND METHOD

Study Design and Study Setting

The current research was carried out at a university (Saveetha dental college and hospitals, Chennai, India). As a result, the data accessible is from patients who live in the same geographic area and are of comparable ethnicity. The retrospective analysis was conducted using digitised case information from 58 patients who had visited the hospital. The hospital's Scientific Review Board granted ethical approval to perform this research.

Sampling

The data of 58 patients was analysed and retrieved. In the given time frame, all patients receiving orthognathic surgery were examined. To reduce sample bias, only relevant data was included. The sample was taken using a simple random sampling procedure. The presence of a second reviewer and photographic evaluation were used to double-check the data for errors. The study was ruled out due to insufficient data gathering.

Data Collection

From June 2019 to June 2021, a single calibrated examiner reviewed the digital case data of patients who reported to Saveetha Dental College. The data of patients receiving orthognathic surgery served as the study's inclusion criteria. Age, gender, kind of surgery, orthodontic classification, and method of fixation were all collected. All of the information gathered was tallied in Microsoft Excel documents.

Statistical Analysis

The information gathered was tabulated and analysed using the Statistical Package for Social Sciences for Windows, version 20.0 (SPSS Inc., Vancouver style), and the findings were obtained. The frequency and percentage of categorical variables were used. The Chi square test was performed to determine whether category variables were related. Age and gender were used as independent variables, whereas kind of surgery, orthodontic categorization, and method of fixation were used as dependent variables. The pearson chi square test was used to conduct the statistical analysis. Statistical significance was defined as a P value of less than 0.05.

RESULTS

In our study, majority of the patients were between the age group of 21-30 years (63.8%), but there was not much of a difference between the genders, male patients comprisedfor (52%) and female patients for (48%).

Class I malocclusion was found to be the highest among all patients accounting for 58.6% of allthe cases.

Bijaw surgery had a slight predominance (57%) over single jaw surgery, and the choice of fixation was miniplates for 70% of the cases.

On associating age with Orthodontic classification, class I malocclusion was found to be the highest in all the three age groups,(Figure1) and on associating the type of surgery with the age, bijaw surgery had a slight predominance among all age groups. (Figure3)

On associating gender with Orthodontic classification, class I malocclusion was found to be the highest among both the genders,(Figure5) and on associating the type of surgery with the gender, bijaw surgery had a slight predominance in both males and females. (Figure7)

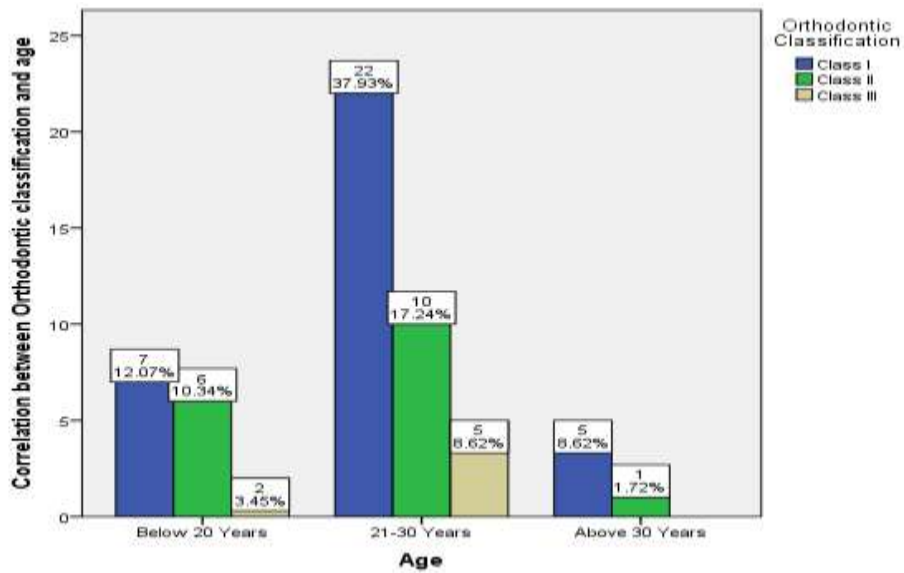


Figure1: This graph represents the association of age with orthodontic classification. X-axis denotes the different age groups and Y-axis denotes the number of patients. Blue colour denotes “class I”, green colour denotes “class II”, and brown colour denotes “class III”. Class I malocclusion was found to be the highest in all the three age groups. The Chi square test was found to be statistically not significant ($p = 0.59$)

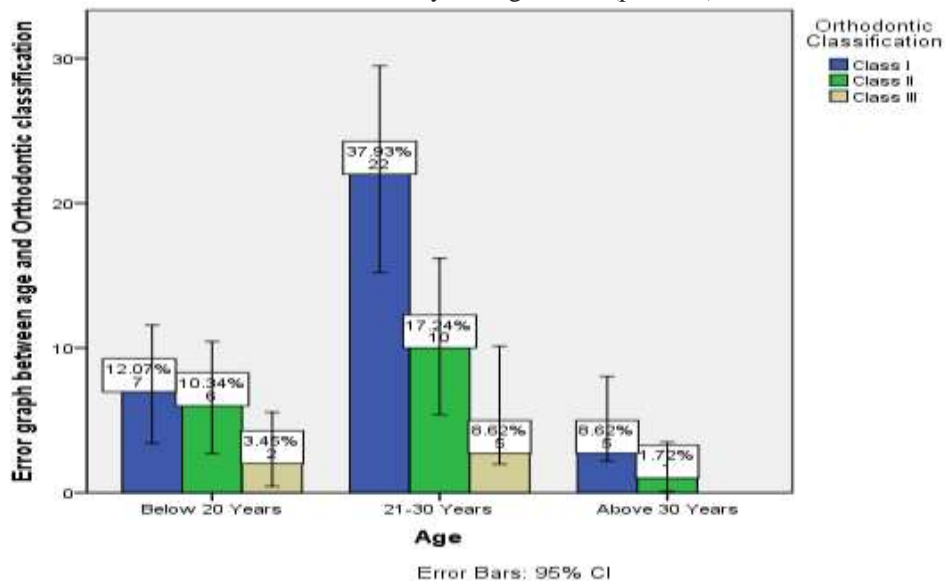


Figure2: This graph represents the association of age with orthodontic classification. X-axis denotes the different age groups and Y-axis denotes the number of patients. Blue colour denotes “class I”, green colour denotes “class II”, and brown colour denotes “class III”. Class I malocclusion was found to be the highest in all the three age groups. The Chi square test was found to be statistically not significant ($p = 0.59$)

Error graphs help to indicate estimated error or uncertainty to give a general sense of how precise a measurement is. This is done through the use of markers drawn over the original graph and its data points. Typically, error bars are used to display either the standard deviation, standard error, confidence intervals or the minimum and maximum values in a ranged dataset.

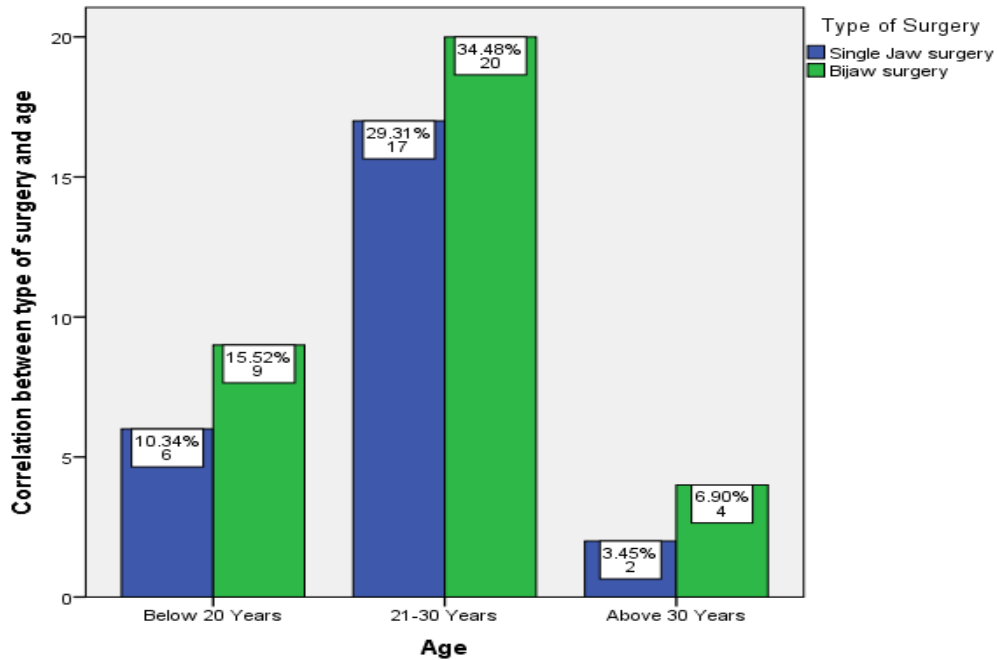
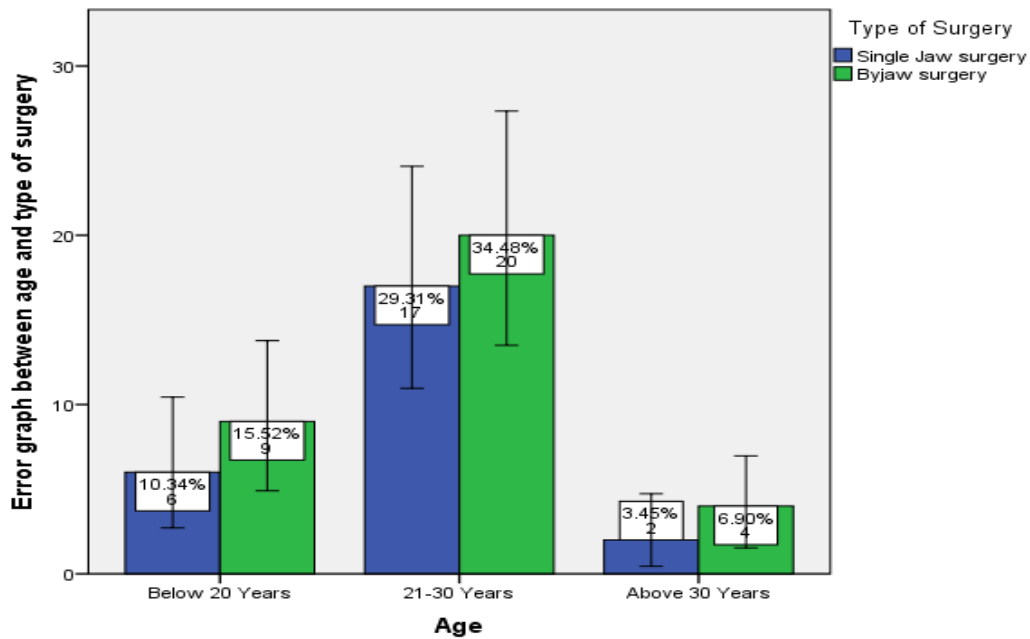


Figure3: This graph represents the association of age with the type of surgery. X-axis denotes the different age groups and Y-axis denotes the number of patients. Blue colour denotes “single jaw surgery”, and green colour denotes “bijaw surgery”, bijaw surgery had a slight predominance among all age groups. The Chi square test was found to be statistically not significant ($p = 0.81$)



Error Bars: 95% CI

Figure4: This graph represents the association of age with the type of surgery. X-axis denotes the different age groups and Y-axis denotes the number of patients. Blue colour denotes “single jaw surgery”, and green colour denotes “bijaw surgery”, bijaw surgery had a slight predominance among all age groups. The Chi square test was found to be statistically not significant ($p = 0.81$)

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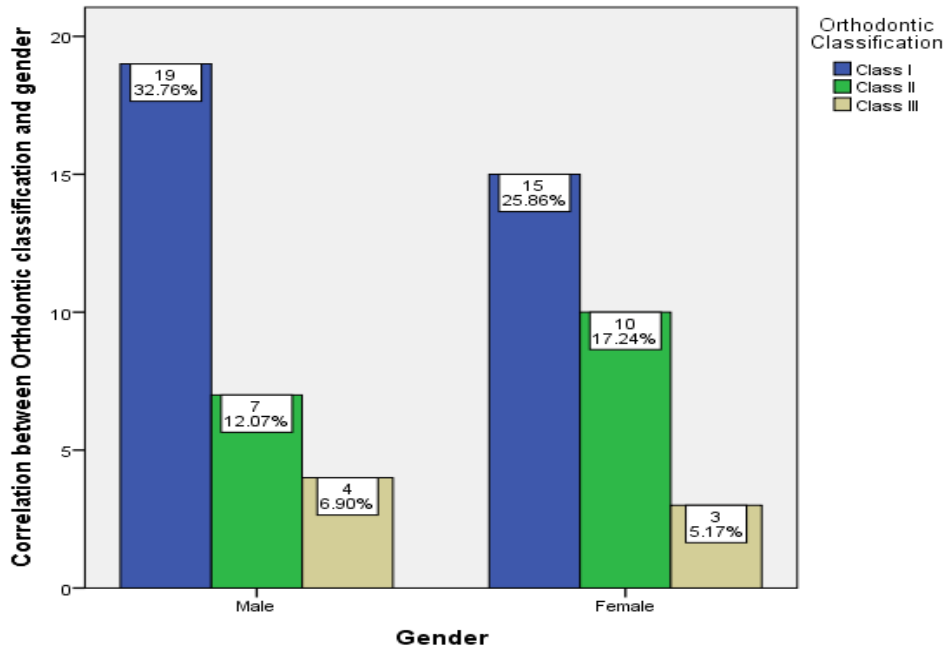
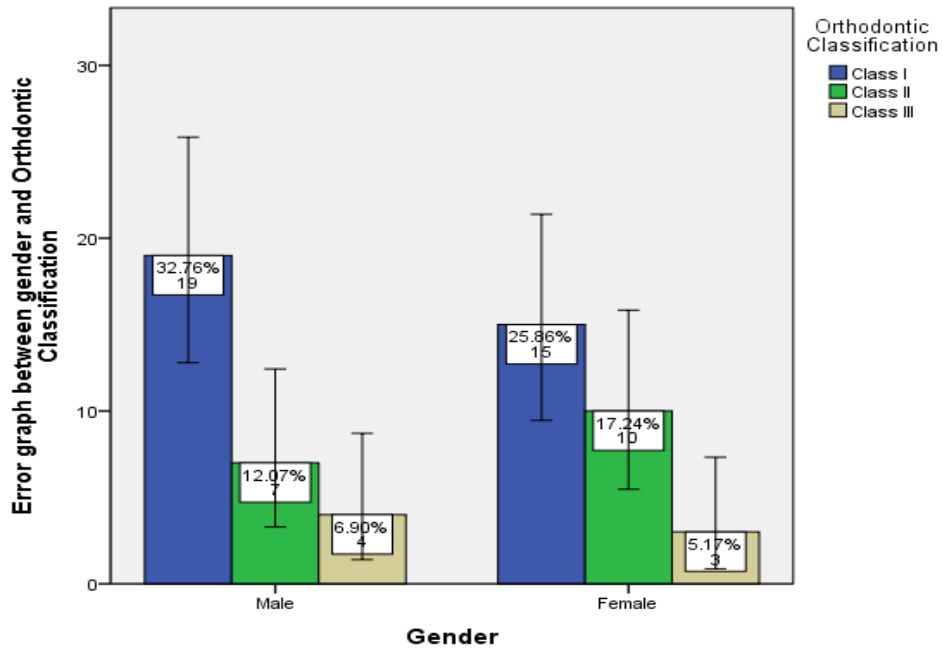


Figure5:This graph represents the association of gender with orthodontic classification. X-axis denotes the genders and Y-axis denotes the number of patients .Blue colour denotes “class I”, green colour denotes “class II”, and brown colour denotes “class III”.Class I malocclusion was found to be the highest in both the genders. The Chi square test was found to be statistically not significant ($p = 0.58$)



Error Bars: 95% CI

Figure6:This graph represents the association of gender with orthodontic classification. X-axis denotes the genders and Y-axis denotes the number of patients .Blue colour denotes “class I”, green colour denotes “class II”, and brown colour denotes “class III”.Class I malocclusion was found to be the highest in both the genders. The Chi square test was found to be statistically not significant ($p = 0.58$)

Error graphs help to indicate estimated error or uncertainty to give a general sense of how precise a measurement is. This is done through the use of markers drawn over the original graph and its data points. Typically, error bars are used to display either the standard deviation, standard error, confidence intervals or the minimum and maximum values in a ranged dataset.

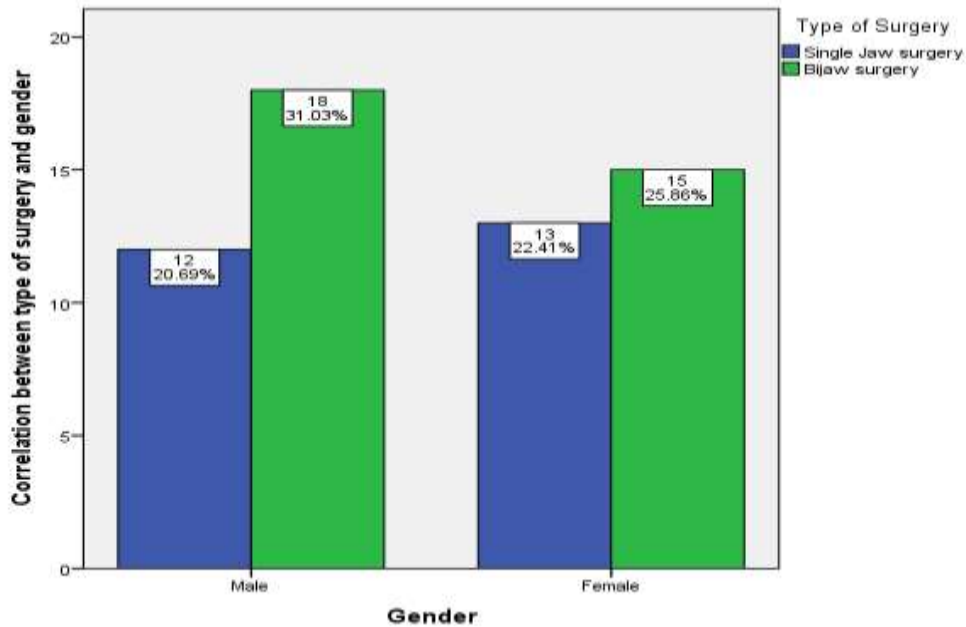


Figure7: This graph represents the association of gender with the type of surgery. X-axis denotes the genders and Y-axis denotes the number of patients. Blue colour denotes “single jaw surgery”, and green colour denotes “bijaw surgery”, bijaw surgery had a slight predominance among both the genders. The Chi square test was found to be statistically not significant. ($p = 0.62$)

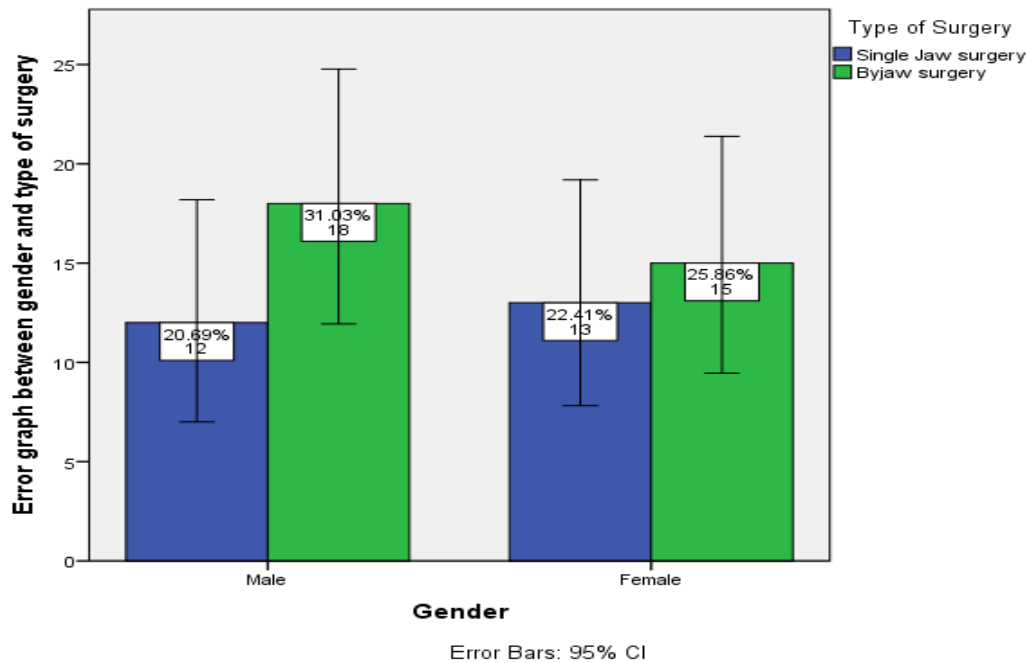


Figure8: This graph represents the association of gender with the type of surgery. X-axis denotes the genders and Y-axis denotes the number of patients. Blue colour denotes “single jaw surgery”, and green colour denotes “bijaw surgery”, bijaw surgery had a slight predominance among both the genders. The Chi square test was found to be statistically not significant. ($p = 0.62$)

Error graphs help to indicate estimated error or uncertainty to give a general sense of how precise a measurement is. This is done through the use of markers drawn over the original graph and its data points. Typically, error bars are used to display either the standard deviation, standard error, confidence intervals or the minimum and maximum values in a ranged dataset.

DISCUSSION

Malocclusion is defined as an occlusion in which the arches are misaligned in any plane or where there are anomalies in tooth location, number, form, and developmental position that are outside of normal parameters. The desire to seem attractive, self-perception of dental appearance, self-esteem, gender, age, and peer-group norms all influence whether or not to pursue orthodontic treatment. (2) Orthognathic surgery is a unique face surgical procedure in that it can significantly improve a patient's appearance and occlusal function, as well as their feeling of self and well-being. From preoperative planning to occlusion finalisation, close collaboration between the surgeon and the orthodontist is critical for optimal outcomes in modern orthognathic surgery. (7,8)

Males made up a greater proportion of the patients in this study (51.7 percent). The findings do not match statistics from the literature, which shows that the number of females is slightly higher. Females accounted for 60.93 percent of the patients treated surgically for a skeletal abnormality, according to Sato et al. (34) Dedong et al. published a study in which they found that The authors state that the primary motivation for surgical treatment in both females (83.87 percent) and males (59.0 percent) is to improve the appearance of the face. (a whopping 83.33 percent). The second most important factor is increased self-confidence (43.55 percent). The third factor is the improvement of occlusion in patients (41.94 percent) as a determinant of skeletal deformity surgical treatment. (35) Takatsui et al. discovered a substantially bigger number of females (68.0 percent) getting surgical treatment in a study that looked at psychological implications of orthognathic surgery. (8) The disparity in results could be attributed to variances in the geographic locations of both studies, and females' modest dominance could be owing to a higher desire to improve their face traits and attractiveness.

Because of their complete bone growth, patients aged 20–30 make up the majority of those seeking surgical treatment. As a result, they can undergo surgical therapy without fear of limiting the formation of the face skeleton's bone. Furthermore, because of the patient's emotional maturity and when decisions are made based on his or her requirements rather than external incentive, this is the best age for an orthodontist to suggest the patient for sophisticated orthodontic and surgical therapy (doctor, parents). (36) Patients aged 21–30 made up the biggest percentage of the group in our study, accounting for 63.7 percent, which is consistent with other authors' findings. (35,37,38)

Bijaw surgery was the most commonly performed type of surgery in our study, with 57 percent of cases requiring it. The prevalence of bijaw operations has been documented in numerous retrospective studies. (4,39) It could be due to considerable advancements in diagnostic devices, increased understanding of the impact of orthognathic treatment on occlusion and aesthetics of the face, as well as respiratory tract qualities, and ongoing improvements in surgical procedures, including shorter operation times. (3,39,40)

Furthermore, we discovered a link between the type of operation and the skeleton class in our research. Bijaw operations were performed more frequently in individuals with skeletal Class I and Class II than in patients with skeletal Class III. The findings contradict numerous instances in which the correction of skeletal Class III is treated with two jaw corrective osteotomies. It could be due to increased patient awareness of bimaxillary surgery's safety, improved aesthetic results, and the most significant benefit, which is the maintenance of therapeutic effects after bijaw surgery.

Orthognathic surgery has proven to be a safe and effective procedure with a low complication rate. Despite the wide range of issues recorded, their occurrence appears to be uncommon. Orthognathic surgery seems to be a relatively risk-free technique. Orthognathic surgeries are generally well received, and considerable improvements in oral health-related quality of life are common. (41)

The study's drawbacks include a small sample size and regional restrictions. More research with a larger sample size and a more geographical focus could aid in better diagnostic and treatment planning for orthodontic procedures.

CONCLUSION

Patients with skeletal Class I made up the highest percentage of the study group (58.6%), according to the findings. Patients aged 20–30 were the most prevalent group among those seeking therapy, with bijaw procedures having a minor predominance. In modern orthognathic surgery, good outcomes can be achieved through close collaboration between the surgeon and orthodontist at all stages of treatment, from preoperative planning to occlusion finalisation.

ACKNOWLEDGEMENT

This research was supported by Saveetha Dental College and Hospitals. We thank the department of Oral medicine and Radiology, Saveetha Dental College for providing insight and expertise that greatly assisted the research.

SOURCE OF FUNDING

The present project is sponsored by

- Saveetha Institute of Medical and Technical Sciences
- Saveetha Dental College and Hospitals
- Saveetha University
- Marble Centre

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