Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Spl Issue [2] 2022 : 479-483

Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD

REVIEW ARTICLE **OPEN ACCESS**

Peri-Operative Care in Orthognathic Surgery: A Review

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ABSTRACT
Orthognathic surgery is advised in patients with skeletal deformities and causes a huge impact in the patient's mental and physical health. Several measures should be taken into consideration along with an integrated strategy to make the process of surgery from hospitalization until the discharge a smooth sail. This article provides an overview from pre-operative patient counselling to post-operative pain management that helps the patients as well as the surgeons for a safe and successful Orthognathic surgery.
Key words: Peri operative care, orthognathic surgery, patient care, enhanced recovery

Received 20.08.2022 Revised 21.08.2022 Accepted 22.10.2022

INTRODUCTION

Orthognathic surgery influences the wellbeing and mental health of patients with maxillofacial deformities to a significant level. They face concerns with body confidence, phobia of the crowd, and faith in oneself. These patients undergoing Orthognathic Surgery experience high levels of emotional distress. The communication between the patient and the surgeon is important when it comes to such surgeries. Patient perception and knowledge regarding the pre-operative procedures to post-operative complications [1] and outcomes help to achieve acceptable results and patient satisfaction. Therefore a multi-disciplinary approach is required for a smooth sailing and complication free surgery and recovery. The Phase-wise management of the patient from counselling, medication, blood work to measures taken in the operation theatre until patient's discharge makes significant improvements in patient outcome.

PERI OPERATIVE CARE

Prior to, during, and following surgery, integrated care is provided to the whole patient treatment journey. The practice of providing patients with patient-centered, interdisciplinary, and integrative medical care from the time they begin to consider having surgery until they have fully recovered is known as perioperative care, also known as perioperative medicine. Good perioperative care should enhance the patient's experience of care, including the standard of care and patient satisfaction, enhance population health, including return to home or employment and quality of life, and lower per capita health care costs by enhancing value. Peri-operative care in orthognathic surgery is should be followed to ensure enhanced recovery of the patients. This can be categorized as pre, intra and post-surgical phases (figure 1).

PRE OPERATIVE

Patient education and counselling

The patient should be well informed about the surgery, the duration, the path and the possible outcomes. The patient should also be asked about the help required, if any, at psychological or social levels [2]. In a study done by Williams et al, they concluded that for orthognathic patients, enhancing dental aesthetics and avoiding future dental issues are the main driving forces. The majority of patients, especially younger patients and men, expressed surprise at the length of treatment and the necessity to wear retainers, despite the fact that they were quite clear about what to anticipate from their orthodontic treatment. This implied what patients with orthognathic conditions can gain from improved knowledge of the orthodontic components of their treatment and stay motivated about the treatment.

In the preliminary consultation of patients who are being taken into consideration for combined orthodontic-orthognathic surgical therapy, orthodontists are essential. Before starting treatment, it is critical to carefully examine the problems of the patient. The patient must also be able to express the

problems they believe will be resolved by upper or lower jaw surgery [3]. The aim of the research was to assess patient reasons for receiving orthognathic therapy and their experiences with the orthodontic parts of this treatment using a patient- centered measure in the form of a postal questionnaire. The questionnaire was developed based on patient-relevant difficulties discovered in a prior study utilising qualitative research techniques.

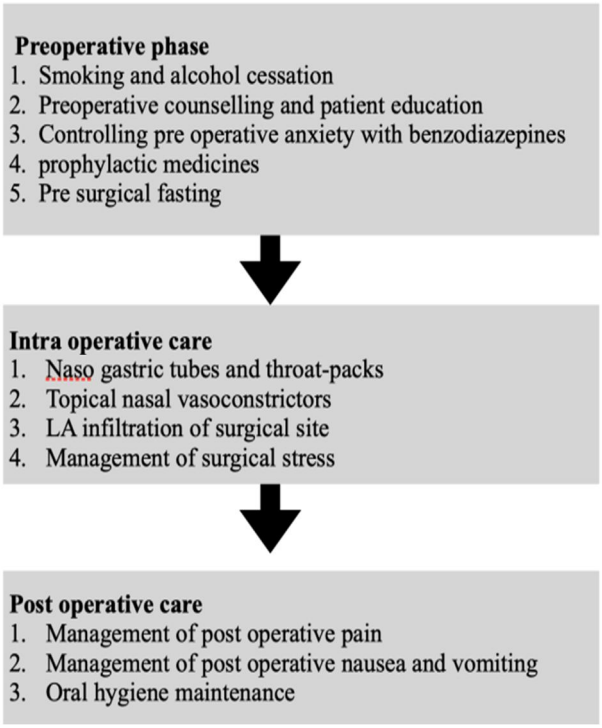

Figure 1: Flowchart summarizing peri-operative care in orthognathic surgery.

The purpose should be to assess patient reasons for receiving orthognathic therapy and their experiences with the orthodontic parts of this treatment using a patient-focused measure in the form of a questionnaire.

Tissue prediction software's and methodologies

Orthognathic surgeries are usually planned in with two-dimensional analysis. Three dimensional assessment of the tissues and surrounding structures in surgeries like mandibular or maxillary advancement, and hence deriving a surgical plan can be beneficial to the surgeon as well as the patient. The patient can hence visualize the treatment outcome and will be motivated towards the surgery which will lead to better treatment outcomes and enhanced recovery.

The ability to explore surgical planning and the effects of various clinical approaches is made possible by the advancement of 3D graphics and imaging tools. These methods are built on data obtained with computed tomography (CT) and cone bean computed tomography (CBCT), which provide volumetric images of facial anatomical structure. Furthermore, using 3D laser technology, to highlight the effects of shifts in facial appearance, the region of the face can be evaluated and mapped. This is highly useful in assisting surgeons in determining the types of operations to carry out as well as the size and placement of procedural manoeuvres to correct face defects [4].

These procedures aim to improve the patients' facial aspect aesthetically in addition to functionally correcting the patients' facial malformations. As a result, correct treatment plan is crucial in achieving an excellent aesthetic and occlusal result [5]. There are many programmes that offer surgical planning as well as for predicting tissue displacements, but their efficiency is still a factor whose reliability is unknown to surgeons. There are certain inconsistencies in certain regions of the face produced by Maxilim, Dolphin, and other popular planning tools, and it is not entirely evident how the predictions are made by the software or what mathematical framework they are based on.

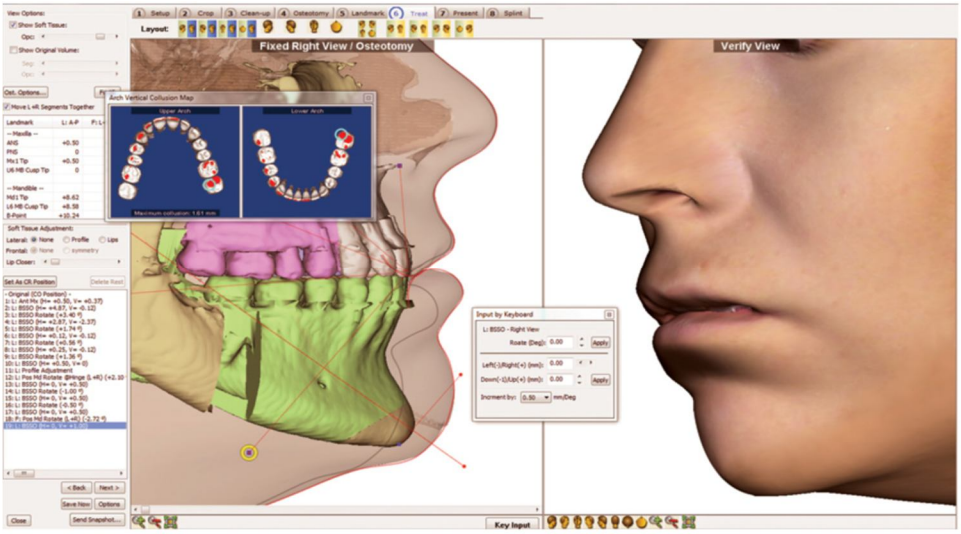

Figure 2: 3D Surgery™ Software by Dolphin Imaging software for tissue prediction

Control of pre- operative anxiety

Anxiety is common in expectation of a surgery but should be managed or brought under control before the surgery. Because it fosters worry about the surgical process, the waiting phase before the procedure may assist in causing stress. The patient feels concern about the result of the procedure and fear that anything can go wrong during the process [6].

In reaction to fear and pressure, anxiety triggers production of epinephrine and norepinephrine, that raises cardiac output by increasing blood pressure and heart rate [7]. It may have psychological components that interfere with everyday tasks like learning and focus. It's crucial to keep patients' anxiety levels to a minimal before surgery since stressed patients may find it difficult to remember crucial instructions for aftercare. In expectation of waiting for surgery, being in an unfamiliar territory, feeling of no authority, being isolated from known and loved ones, the outcome of unknown and undesirable diagnoses, lack of certainty in recovery after the surgery, and a conviction that one cannot control the course of events are some of the factors that can cause stress in individuals during the pre-surgical phase [8].

Anti-anxiety drugs such as opiods, benzodiazepines and barbiturates are commonly used in such cases Midazolam is a water soluble benzodiazepine that has a high metabolic clearance rate. It has rapid onset and can be administered with multiple roots and has very few side effects like nausea, vomiting [9-10].

Smoking and alcohol cessation

Smoking can delay wound healing, cause post-operative cutaneous necrosis and complications at the surgical site as given by Pluvy *et al*. [11]. Cessation of smoking should be recommended to the earliest and tobacco cessation counselling should be given to the patients in the need for the same. Cessation of alcohol of more than 60g per day showed less wound related, cardiac, pulmonary, ICU admissions, hospital stay and mortality in a study done by Oppedal et *al*.[12]

Surgery-related trauma can further reduce the weak DHT response in surgical patients, which could damage their postoperative immune system. Other mechanisms that may help explain why patients who consume large amounts of alcohol may experience more complications following surgery include prolonged bleeding times and a heightened endocrine stress response. Blood levels of adrenaline, dopamine, and cortisol can be used to detect increasing endocrine stress [13].

Smoking has a deleterious impact on surgical outcomes because the nicotine and carbon monoxide in cigarettes raise heart rate, can cause hypertension and increase body's need for oxygen. Additionally, nicotine produces vasoconstriction, which lowers the blood to reach several areas of the body. Smokers are more vulnerable to infection, coughing, pulmonary problems, and extended mechanical ventilation because smoking narrows the tiny airways in their lungs, increasing their risk of collapse. Additionally, smoking raises the chance that blood will clot and impairs immunological responses necessary for wound healing 14].

Prophylactic drugs

A clean contaminated wound where the viscera is entered without any atypical contamination under controlled condition is called Orthognathic surgery. The infection at surgical site in Orthognathic surgery is almost 10-15% when performed without prophylactic antibiotics therefore penicillin and amoxicillin

are recommended for prophylaxis as it covers the oral flora. Although Peterson et al did find some statistically non-significant changes in relation to the type of orthognathic surgery, they did not find any variation in the occurrence of infectious diseases whether prophylactic antibiotics were administered or not [15-17].

In his non prophylaxis group, Yrastorza showed a statistically insignificantly decreased incidence of infection. Only patients with relevant medical histories like rheumatic fever, physiological disorders that might reduce immunity to septic environments, and the ones undergoing an removal of bone structure that necessitates the use of significant grafts, should be given prophylactic antibiotics during orthognathic surgery, according to him[18]. It's critical to evaluate the potential advantages and risks of using antibiotics due to the rise in antibiotic resistance. Resistance is a serious danger to the current advanced medical system because the outcomes of many therapeutic procedures depend on good infection control and treatment.

Fasting before the surgery

It is standardized that the patient fasts overnight before the surgery or a minimum of 6 hours for adults it is now allowed for the adults and children for 6hours of solids and 2 hours of clear fluids before surgery [19].

INTRA OPERATIVE

Nasogatric tubes

It is introduced after intubation and removed before extubation in lower jaw surgery. To check if there is no posterior bleeding after the surgery the nasogastric tube is removed after the 1st checkup in the ward. It lessens PONV by aspirating unintentionally ingested fluids like blood and washing out fluids from the sinuses. Because of their different types of trauma, pharyngeal swelling, and hoarseness, and increased risk of problems including ingestion of unwanted substances, throat packs are not something that is recommend using. Although invasive medical treatments carry some level of risk, the blind, unsupported technique of implantation puts the gastric tube at considerable risk hence should be carefully administered [20]

Operating time

It is one of the most important factors. It is directly related to patient recovery and hospital stay. The longer the operating time, increased are the stakes for post-operative complications like infection at the surgical site, delayed wound healing and morbidity. The operative time hence differs while performing procedures like upper jaw surgeries that average- 80min, BSSO averages- 80min, bimaxillary osteotomy combined with genioplasty increases the time of performing the surgery by half an hour and of a mandibular advancement along with chin augmentation is another added half an hour [21]. It is hence important to organize and plan to decrease the surgical time.

Local Anesthesia at the surgical site

A significant relief from the pain medications taken post-surgery and shorter hospitalisation have been linked to the infiltration of local anaesthetic in the surgical incision [22]. Before the sagittal split, a long-lasting anaesthetic like ropivacaine can be used to locally block the third branch of the trigeminal nerve on both sides of the body [23].

POST OPERATIVE

Oral hygiene

Not only maintaining the oral hygiene before the surgery but also after the surgery is most importance to prevent any chances of infection at or around the surgical site. The patient should be motivated to start maintaining the oral hygiene that will lead to decreased hospital stay and enhanced recovery. The patients should be instructed to rinse with 0.12% chlorhexidine mouth wash, at-least three times a day and afterword's start with light brushing at reachable areas.

Patient position and cold compression

For a pressure gradient created by gravitational force for venous and lymph flow the head of the bed should be elevated for 30° or more[24]Localised cold compression packs after surgery helps reducing pain, edema and swelling.

Post-operative pain management

Correct pain management can help with patient's stay at the hospital and increase chances of early discharge. The right amount of analgesics depending on the severity of pain can help controlling the post-operative pain.

CONCLUSION

A multidisciplinary approach including the peri operative protocols will lead to enhancements in patient's health and therefore the surgical outcome. The protocols detailed are a key to have a smooth sail in the management of orthognathic surgery patients and hence aiming to improve patient comfort, reduce hospital stay and enhance the recovery process.

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CITATION OF THIS ARTICLE

S Agarwal, P Aggarwal. Clinical Evaluation of Application Of Oxygen Releasing Gel as an Adjunct To Scaling and root planing In Chronic Periodontitis - A Case Report. Bull. Env.Pharmacol. Life Sci., Spl Issue [2]: 2022: 479-483