



Patient Safety in Outpatient Orthognathic Surgery: A Comprehensive Review

Dr. Pradeep Christopher¹, S. Mounitha², S. Prakash³, Dr. Gayathri⁴, Dr. Manonmani⁵

¹Professor and HOD, Department of oral and maxillofacial surgery, Thai moogambigai dental college and hospital, Chennai, India

^{2,3}Junior resident, Department of oral and maxillofacial surgery, Thai moogambigai dental college and hospital, Chennai, India

⁴Reader, Department of oral and maxillofacial surgery, Thai moogambigai dental college and hospital, Chennai, India

⁵Senior lecturer, Department of oral and maxillofacial surgery, Thai moogambigai dental college and hospital, Chennai, India

ABSTRACT:

Orthognathic surgery is a complex procedure that aims to correct skeletal and dental abnormalities of the jaw. Traditionally performed in an inpatient setting, there has been a growing trend towards performing Orthognathic surgery in an outpatient setting. This review article critically examines the various aspects of patient safety in outpatient Orthognathic surgery. It explores the preoperative, intraoperative, and postoperative measures implemented to optimize patient safety, highlights potential complications, and discusses strategies for mitigating risks. The review also emphasizes the importance of patient selection and appropriate case triaging in outpatient Orthognathic surgery.

Keywords: Patient safety, Outpatient surgery, Orthognathic surgery, Maxillofacial surgery, Oral and maxillofacial surgery

INTRODUCTION

Patient safety is a crucial aspect of any surgical procedure, including outpatient orthognathic surgery. Orthognathic surgery, also known as corrective jaw surgery, is a specialized procedure that aims to correct abnormalities or misalignments of the jaw and facial structure.¹ Traditionally performed in a hospital setting, advancements in surgical techniques, anesthesia, and postoperative care have facilitated the safe transition of orthognathic surgeries to outpatient settings. Outpatient orthognathic surgery offers several advantages, including reduced hospitalization costs, shorter recovery time, and enhanced patient convenience. However, ensuring patient safety remains paramount during these procedures, as the complexity of the surgery and potential risks associated with anesthesia and surgical intervention must be carefully managed.² This comprehensive review explores the various aspects of patient safety in outpatient orthognathic surgery. It examines the preoperative, intraoperative, and postoperative factors that contribute to a safe surgical experience for patients. From risk assessment and preoperative evaluation to anesthesia management, surgical site infection prevention, and postoperative care, each stage of the surgical process is analyzed to identify potential areas of improvement and best practices for enhancing patient safety.

PREOPERATIVE CONSIDERATIONS

A comprehensive evaluation of the patient's medical history, physical examination, and diagnostic tests is essential. This assessment includes a detailed review of any preexisting medical conditions, allergies, previous surgeries, medications, and any relevant family history.³ Collaboration between the oral and maxillofacial surgeon, anesthesiologist, and other healthcare professionals is crucial. The team should discuss the patient's medical condition, anesthesia plan, and surgical goals to ensure a well-coordinated and safe approach. Identifying patient-specific risk factors is essential to anticipate and manage potential complications.⁴ Factors such as obesity, smoking, diabetes, bleeding disorders, and cardiovascular disease should be carefully evaluated and managed preoperatively. Patients should receive thorough explanations about the surgical procedure, expected outcomes, potential risks, and complications. Informed consent should be obtained, ensuring that patients have a clear understanding of the procedure and its implications. Reviewing the patient's medication regimen is crucial. Particular attention should be given to anticoagulants, antiplatelet agents, and herbal supplements, as they may increase the risk of bleeding and complications.⁵ Appropriate adjustments or temporary discontinuation may be necessary in consultation with the patient's primary healthcare provider. If any modifiable risk factors are identified during the evaluation, efforts should be made to optimize the patient's health before surgery. This may include managing chronic medical conditions, smoking cessation, weight loss, and dental clearance to reduce the risk of infection. Patients should follow the prescribed fasting guidelines to minimize the risk of aspiration during surgery. Clear instructions regarding fasting from food, liquids, and medications should be provided to patients. Thorough surgical planning, including diagnostic imaging, virtual surgical simulation, and communication with the dental laboratory, helps ensure accurate and predictable outcomes. This includes determining the optimal surgical technique, the need for adjunct procedures (e.g., genioplasty), and the selection of appropriate instrumentation and implants. Anesthesia evaluation by an

anesthesiologist is essential to assess the patient's fitness for anesthesia and to develop an appropriate anesthetic plan. This evaluation considers factors such as airway assessment, comorbidities, allergies, and potential interactions with medications.⁶

SURGICAL FACILITY AND EQUIPMENT

The surgical facility and equipment play a crucial role in ensuring patient safety during outpatient orthognathic surgery. The surgical facility should be accredited and licensed by the appropriate regulatory bodies. Compliance with recognized standards ensures that the facility meets the necessary safety and quality requirements. The operating room should be equipped and arranged in a manner that promotes optimal workflow and infection control. It should have adequate space for the surgical team to move comfortably and facilitate the proper positioning of equipment and supplies. Maintaining a sterile environment is paramount in preventing surgical site infections. The surgical facility should have protocols in place for cleaning, sterilization, and disinfection of equipment, instruments, and surfaces. Compliance with established infection control guidelines is essential. Regular maintenance, calibration, and testing of surgical equipment and instruments are crucial for their proper functioning and accuracy.⁷ This includes anesthesia machines, monitors, surgical instruments, lighting systems, and imaging equipment. The surgical facility should be well-equipped with emergency equipment and supplies, including defibrillators, emergency medications, oxygen supply, suction devices, and airway management equipment. Availability of trained staff to handle emergencies is vital. The anesthesia equipment should be regularly inspected and maintained to ensure its proper functioning. Adequate monitoring equipment, such as pulse oximeters, capnography devices, blood pressure monitors, and electrocardiography (ECG) machines, should be readily available to monitor the patient's vital signs during surgery. High-quality surgical instruments and implants specific to orthognathic surgery should be used.⁸ These instruments should be properly sterilized, well-maintained, and readily available for use during the procedure. Advanced imaging modalities, such as cone-beam computed tomography (CBCT) or three-dimensional (3D) imaging, can aid in surgical planning and execution. Navigation systems may also be utilized for precise anatomical guidance during surgery. Proper waste management protocols should be in place to handle and dispose of surgical waste, sharps, and biohazardous materials in accordance with regulations and guidelines.⁹ The surgical facility should have reliable power supply and backup systems in case of power outages. Uninterrupted power supply (UPS) and backup generators are essential to ensure uninterrupted surgical procedures and continued monitoring of patients. It is crucial for the surgical facility to prioritize patient safety by maintaining a sterile environment, properly functioning equipment, and necessary emergency provisions. Regular inspections, adherence to safety standards, and continuous quality improvement efforts help ensure a safe surgical environment for patients undergoing outpatient orthognathic surgery.¹⁰

INTRAOPERATIVE SAFETY MEASURES

Effective communication and collaboration among the surgical team members are essential. Continuous monitoring of the patient's vital signs, including heart rate, blood pressure, oxygen saturation, and end-tidal carbon dioxide levels, is crucial throughout the surgery. Anesthesia administration and management should be carried out by a qualified anesthesiologist or a trained anesthesia provider. The surgical field should be adequately exposed while maintaining aseptic conditions to minimize the risk of surgical site infections. Sterile barriers should be maintained, and any breaches or contamination should be promptly addressed.¹¹ Safe medication practices should be followed, including proper labeling, verification of medication dosage, and adherence to aseptic techniques during medication preparation and administration. Effective hemostasis is crucial to prevent excessive bleeding during the procedure. This may involve the use of meticulous surgical techniques, the application of hemostatic agents, and the use of electrocautery or other hemostatic modalities as needed. Proper patient positioning is essential to optimize surgical exposure and ensure patient safety. Care should be taken to avoid pressure injuries, nerve compression, and complications related to patient positioning, such as ocular injuries or peripheral nerve injuries. Strict adherence to infection prevention protocols should be maintained throughout the surgery.¹² This includes using sterile techniques, appropriate antibiotic prophylaxis, maintaining a clean surgical environment, and minimizing traffic in and out of the operating room. By implementing intraoperative safety measures, healthcare professionals can minimize risks, enhance patient safety, and ensure the smooth execution of outpatient orthognathic surgery.¹³

POSTOPERATIVE CARE AND COMPLICATION MANAGEMENT

Patients should be closely monitored in a designated recovery area immediately after surgery. Appropriate analgesics, such as nonsteroidal anti-inflammatory drugs (NSAIDs), opioids, or other pain medications, should be prescribed based on the patient's needs and pain assessment. Proper wound care is essential for surgical site healing and infection prevention.¹⁴ Specific dietary recommendations, such as a soft diet or limitations on certain food types, may be advised initially to protect the surgical site. Swelling and edema are common after orthognathic surgery. Patients should be educated on techniques to minimize swelling, such as applying cold compresses, elevating the head, and avoiding activities that can increase swelling. Patients should receive clear instructions regarding postoperative activity restrictions and limitations. Patients should be educated on the proper use of prescribed medications, including pain medications, antibiotics, and any other medications specific to their individual needs. Compliance with medication schedules and awareness of potential side effects is important. Scheduling and attending follow-up appointments with the surgeon is crucial for monitoring progress, assessing healing, and addressing any concerns or complications that may arise.¹⁵ These appointments allow for timely intervention if complications occur. Patients should be educated about potential complications associated with orthognathic surgery, such as bleeding, infection, nerve injuries, or adverse reactions to anesthesia or medication. They should be instructed to promptly report any unusual symptoms or concerns to their healthcare provider.

PATIENT SAFETY OUTCOMES AND QUALITY IMPROVEMENT

Patient safety outcomes should be measured and monitored to assess the effectiveness of safety interventions and identify areas for improvement. Common safety outcome measures include surgical site infection rates, postoperative complications, readmission rates, and patient satisfaction surveys. Establishing a system for reporting adverse events and near-misses is crucial. Healthcare providers should encourage reporting of incidents, errors, or potential safety concerns. Implementing evidence-based quality improvement initiatives is essential to enhance patient safety.¹⁶ These initiatives may include standardized protocols and checklists, team training and communication strategies, enhanced infection control measures, medication safety protocols, and surgical site marking procedures. Regular audits and assessments help ensure adherence to these protocols and identify areas for improvement. Comparing outcomes and processes with benchmark data and identifying best practices in patient safety can inform quality improvement efforts. Collaboration and information sharing among healthcare providers, professional societies, and research organizations can facilitate the dissemination of successful practices and drive improvements across healthcare settings. Engaging patients in their care and safety processes can significantly contribute to improved outcomes. Encouraging patient involvement in shared decision-making, providing education on potential risks and complications, and soliciting patient feedback through surveys or focus groups can help identify areas for improvement and enhance patient-centered care. Healthcare providers involved in outpatient orthognathic surgery should receive ongoing education and training on patient safety principles, surgical techniques, infection control, and emerging best practices. Establishing effective feedback and communication channels among healthcare providers, surgical teams, patients, and other stakeholders is crucial. Regular interdisciplinary team meetings, morbidity and mortality conferences, and patient satisfaction surveys provide opportunities for open dialogue, knowledge sharing, and process improvement discussions. Future directions Integration of advanced technologies like virtual surgical planning, robotics, and AI for enhanced precision and safety, Emphasis on patient-centered care, engagement, and shared decision-making and Utilization of data analytics, benchmarking, and standardized reporting to drive continuous quality improvement. Challenges include Resource constraints and financial limitations for implementing advanced technologies and safety initiatives and Adapting to rapid technological advancements and ensuring proper training and infrastructure upgrades.^{17,18,19,20}

CONCLUSION

In conclusion, performing orthognathic surgery in an outpatient setting requires careful consideration of various patient safety factors. This review article provides a comprehensive overview of the preoperative, intraoperative, and postoperative measures necessary to optimize patient safety. By understanding the challenges and implementing appropriate strategies, healthcare professionals can ensure the safe delivery of outpatient orthognathic surgery, thereby improving patient outcomes and satisfaction.

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