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Multidisciplinary care in rehabilitation of Maxillofacial defects: A Review

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Abstract

Maxillofacial defects refer to abnormalities or deformities in the facial and jaw regions, which can result from congenital, acquired, developmental conditions, trauma, infection, tumour resection, or surgical complications. These defects can affect the soft tissues, bones, or both, impacting functions like speech, chewing, swallowing, and appearance. Due to which nutrition, confidence and quality of life is affected . “Maxillofacial prosthetics is the branch of prosthodontics concerned with the restoration and / or replacement of the stomatognathic and craniofacial structures with prostheses that may or may not be removed on a regular or elective basis”. Maxillofacial defects are caused due to three main reasons i.e., Congenital, Acquired, Developmental. Management of Maxillofacial defects is based on aetiology, age, area affected, number of structures remaining.

Keywords: Maxillofacial defects; Multidisciplinary Team; Rehabilitation

1. Introduction

Maxillofacial defects are complex and requires a comprehensive approach involving multiple specialists to address function, aesthetics, and psychological aspects effectively. The multidisciplinary team plays a lead role in defect management by improving daily function and quality of life through coordinated diagnosis, treatment planning, surgical reconstruction, rehabilitation, and psychological support. The main pillars for this team are,

2. The Multidisciplinary Team

- The Radiologist,
- Plastic surgeon,
- ENT surgeon(otolaryngologist),
- Oncologist (medical and radiation),
- General Dentist,
- Oral & Maxillofacial Surgeon,
- Maxillofacial Prosthodontist,
- Periodontics,
- Orthodontics,
- The Speech Therapist,
- The Psychiatrist/counsellor,
- The nutritionist/Dietitian,
- Biomedical engineer (material),

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- Nurse specialist [5,15].

2.1. The Radiologist

Radiologist in Multidisciplinary care are mainly for diagnostic assessment and detect using imaging and study the case to form the treatment plan, which helps in fabrication of prosthesis for treatment and planning for radiation stent. They compare intraoperative and postoperative imaging. Additionally, the radiologist oversees post-treatment monitoring and maintains records of scans with consistent imaging tracking. They plan radiotherapy schedule for cancer patients they place and monitor Radiation stent if needed [1].

2.2. Plastic surgeon

The plastic surgeon plays a major role in restoring both function and aesthetics. The cleft lip and palate surgeries in children are guided by plastic surgeon along with other specialities. They perform secondary deformity correction and alveolar bone grafting, reconstructive surgery with grafts and flaps. They correct facial contour and improve quality of life. They collaborate with the rehabilitation team to plan for prosthetic integration and perform microvascular surgery. Additionally, they ensure that postoperative records and patient monitoring are properly managed [2].

2.3. ENT surgeon(otolaryngologist)

ENT specialist performs complete examination of ear, nose, throat and associated structures. They detect lesions in the oral cavity, pharynx, and larynx, including those in the aerodigestive tract, and assess the extent of involvement to differentiate between benign and malignant lesions. They perform precise biopsies and assist pathologists and surgeons with histopathological diagnoses. This surgeon performs procedures like tracheostomy, laryngotracheal etc. An ENT surgeon helps with postoperative care, such as speech and swallowing functions, and monitors for airway complications and prevents recurrence. [3]

2.4. Oncologist (medical and radiation)

The oncologist plays an important role in Multidisciplinary team, that includes role in diagnosis, treatment and surgical rehabilitation Maxillofacial abnormalities include cancers, precancerous and benign tumour. The oncologist helps with staging of the disease, which includes identifying the type of tumour, screening, staging and determine the extent of the disease. Additionally, the oncologist is responsible for planning the chemotherapy and radiation treatments and ensuring that they are integrated with the surgical and rehabilitative aspects. In the postoperative, the oncologist is responsible for pain control, nutritional support, and management of the mental health and disease recurrence, working closely with other surgeons to ensure full functional and aesthetic recovery [4].

2.5. General Dentist

The general dentist has always played a key role in taking care of oral cavity before, during, and after treatment. Often the dentist is the one to detect the abnormalities, leading to early detection and referral of patients suspected of maxillofacial pathology. The general dentist also plays a role in providing presurgical oral preparation before surgery to ensure that the oral cavity is free from any infection and fit for the surgery. They take care of oral hygiene and the prevention of complications such as mucositis, xerostomia, and oral infections during chemotherapy or radiotherapy procedure. They work in with prosthodontists to manage oral hygiene around prosthesis or graft sites, making sure of recovery and comfort. In addition, the dentist provides psychological support, patient support, and coordination with other specialists for the rehabilitation and well-being of the patient [5].

2.6. Oral & Maxillofacial Surgeon

An oral and maxillofacial surgeon examines and directs the correction of congenital, traumatic, and acquired maxillofacial defects, after which it is their responsibility to consult with other experts in order to determine a course of therapy and post-operative care. They make sure to repair facial bone and soft tissue injuries appropriately in the first instance, enabling both structural and functional reconstruction. They work in collaboration with the plastic surgeons and prosthodontists to achieve targeted outcomes towards dental, facial, functional, and aesthetic restoration. They improve oral functions as well as TMJ function after the surgery. In addition, they work with ENT surgeons and oncologists in combined oncologic and reconstructive management, ensuring the patient with maxillofacial defects receives both pathological and structural restoration [6].

2.7. Maxillofacial Prosthodontist

The maxillofacial prosthodontist plays a crucial role in the multidisciplinary treatment and rehabilitation of patients with facial abnormalities. The process begins with pre-operative planning, in which the prosthodontist collaborates closely with surgeons and other experts to create a coherent strategy. Intraoperatively, the fabrication of surgical and interim prostheses is necessary for protecting tissues and contour in the healing process. They work with radiologist to provide radiation stent. A radiation stent is used to protect healthy oral tissues and ensure accurate, reproducible delivery of radiotherapy in maxillofacial cancer patients. It helps minimize radiation damage and supports better long-term functional and prosthetic rehabilitation. Postoperatively, definitive prosthetic rehabilitation occurs to reestablish aesthetics, speech, mastication, and facial harmony. Finally, ongoing maintenance of the prosthesis and supportive care are essential to ensure that it maintains anatomical fit, provides patient comfort, and promotes good hygiene for favourable long-term outcomes. The maxillofacial prosthodontist works in close consultation with other experts during the whole procedure to ensure comprehensive rehabilitation [2,7].

2.8. Periodontics

The periodontist contributes to the multidisciplinary approach towards the treatment of patients with maxillofacial defects. One of the major responsibilities of a periodontist is to give health and stability to the supporting structures. In the preoperative phase the periodontist must aim to eliminate infection. During the surgical phase, supportive periodontal and regenerative surgery should be conducted to enhance both the quality and quantity of soft and hard tissue at the appliance site. This is essential for any subsequent prosthetic or implant treatment. Post-surgery will concentrate on gum and implant-wellness through follow-ups and attentions. The foundation to long term success is the need for periodic periodontal maintenance therapy, checking on how the tissues are responding and reinforcing good home care habits all designed to maintain stability of these restorations in a healthy state [8].

2.9. Orthodontics

The orthodontist is an integral part of the multifactor treatment and rehabilitation in which will allow precise positioning of the jaws and teeth to achieve functional and aesthetic outcomes. In treatment planning, orthodontists work closely with oral and maxillofacial surgeons to determine the spatial position of teeth in relation to the jaw and facial axis. They supply splints and help move the jaw into place, so that everything stays aligned both during and after surgery. Another reason to have orthodontic treatment is to achieve occlusion stability, which is important for successful mastication, distinct speech and appearance shape of face. In cleft and craniofacial patients, the role of the orthodontist is to help direct tooth eruption, collaboratively work on speech and facial development concerns as they relate to function, occlusal jaw relationships and aesthetic features. When orthognathic surgery is crucial to obtaining long-lasting function and aesthetics in maxillofacial rehabilitation, this kind of cooperation is essential to ensure precise planning, coordinated treatment, and optimal patient outcomes [6,9].

2.10. The Speech Therapist

The speech therapist plays a crucial role in the multidisciplinary rehabilitation of patients with maxillofacial defects. The speech therapist is involved with functional reintegration of lips, palate, tongue, jaw and larynx elements. Pre-surgery, the therapist provides a comprehensive evaluation of speech, voice, and swallow function as well as counselling around anticipatory expectations for change following surgery. After the surgery is complete, the speech therapist delivers focused therapy to help patients improve their speech, articulation and swallow, helping them return to be able to communicate and eat. In the case of cleft lip and palate patients, the therapist is also critical in improving articulation, tongue placement and airflow control as well as encouraging speech development and correction with children. The motivational speech therapist improves the patient's capability and security to effectively communicate rewarding success that raises the quality of life [10].

2.11. The Psychiatrist/counsellor

The psychiatrist or counsellor forms a key part of the multi-disciplinary team in rehabilitation, helping them cope with their feelings and attitudes. In the pre-operative period, they evaluate psychological readiness, offer counselling, prepare patients emotionally and assist them in adjusting to expected changes in appearance and function. They help manage post-surgical depression, anxiety and body image following major facial surgeries. The psychiatrist or counsellor also supports patients in managing fear, anxiety and post-traumatic stress, providing tips on coping strategies and emotional resilience. They monitor the patient's mental condition and prompt psychological acceptance and integration into social life, taking care of achieved confidence, social reinsertion and having in mind reconstruction of injured self-esteem, thus maintaining or enabling the overall well-honoured psychic balance [11].

2.12. The nutritionist/Dietitian

The nutritionist or dietitian plays role in the multidisciplinary rehabilitation by ensuring and providing optimal nutrition for healing, recovery, and overall health. Before surgery, they assess the patient's nutritional status and provide dietary counselling to improve immune function and prepare the body for the physiological stress of surgery. In the post-surgical phase, the dietitian designs individualized nutrition plans that accommodate difficulties in chewing, swallowing, or jaw movement, often recommending soft or liquid diets rich in protein, vitamins, and minerals to promote wound healing, management of oral hygiene and tissue regeneration. They also monitor nutritional intake to prevent deficiencies and support weight maintenance during recovery. Additionally, the dietitian collaborates with the surgeon, speech therapist, and prosthodontist to ensure the patient's diet aligns with their functional rehabilitation goals. Through continuous evaluation and counselling, the nutritionist helps enhance healing outcomes, energy levels, and quality of life for patients undergoing maxillofacial rehabilitation [12].

2.13. Biomedical engineer (material)

The biomedical engineer who specializes in material engineering helps to coordinate the multidisciplinary approach to the rehabilitation of maxillofacial defects. This is achieved through the design, development, and assessment of biocompatible materials for reconstruction and prosthetic rehabilitation. They work with surgeons and prosthodontists to identify biomaterials that meet the necessary structural, biological, and functional requirements for integration in the oral cavity and facial area. They also design custom implants or prosthetic components and patient-specific implants (PSIs) that accurately restore the anatomical and function of the affected area in the patient. They also design biocompatible scaffolds and silicone prostheses for the reconstruction of face and tissues using medical grade silicone for integration, aesthetics, and reconstruction. Importantly, they also enhance and advance the engineering and construction of new materials using cutting edge technology to improve outcome, integration of 3D printing, CAD/CAM systems, and nanomaterials. This ensures the integration of medical engineering and personalized maxillofacial rehabilitation [13].

2.14. Nurse specialist

The importance of the nurse specialist in multidisciplinary rehabilitation stems from their ability to coordinate care during the pre-, intra-, and post-operative phases. The nurse conducts a pre-surgical check, ensuring documents are complete, and provides counselling to prepare the patient for surgery. During the intra-operative phase, nurse should help with instrument handling, maintain sterile conditions and aid the surgical team so that a safe and effective surgery could be achieved. Postoperative detailed information on wound dressing, flap dressings and antibiotics, analgesics and antiseptics is given to the nurse as well as symptoms of complications. Additionally, the nurse acts as an interface between experts. The nurse facilitates patient healing, comfort, and overall rehabilitation outcomes by offering both clinical expertise and emotional support [14].

3. Conclusions

The most effective way to treat maxillofacial abnormalities is through comprehensive multidisciplinary teamwork. At each phase, a number of professionals work together to coordinate procedures related to diagnostics, surgical reconstruction, prosthetic rehabilitation and psychological therapy. Complete restoration of form, function, beauty, and well-being is achieved via such cooperation. In order to assist the patient, regain their self-confidence and quality of life, interdisciplinary rehabilitation is crucial. Recovery comprises psychological, emotional, and nutritional elements. This emphasizes the smooth integration of specialist expertise, advanced technology, and caring treatment for patients with a priority on effective social reintegration.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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