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Research on the Clinical Outcomes of Surgical Treatment for Patients with Oral and Maxillofacial Tumors

Ru Xu

Lanzhou University, Lanzhou 730000, Gansu, China

Abstract: Due to the special anatomical location, complex functions, and significant impact on patients' appearance and psychology, the treatment of oral and maxillofacial tumors has always been a key and difficult issue in the field of head and neck surgery. With the rapid development of surgical technology, microsurgical reconstruction technology, perioperative management, and multidisciplinary treatment models, surgical treatment has occupied a core position in the comprehensive treatment system of oral and maxillofacial tumors. Based on this, this paper conducts research on the clinical outcomes of surgical treatment for patients with oral and maxillofacial tumors, expounds the optimization strategies of surgical treatment, and analyzes the clinical effects of the optimized surgical treatment, aiming to provide a reference for the clinical treatment of oral and maxillofacial tumors.

Keywords: Oral and maxillofacial tumors; Surgical treatment; Clinical outcomes; Optimization strategies

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1. Introduction

The oral and maxillofacial region includes multiple important anatomical structures such as the oral cavity, jawbones, salivary glands, facial skin, and soft tissues. For tumors occurring in this region, whether benign or malignant, treatment decisions need to seek a difficult and precise balance between eradicating the disease, preserving functions, and maintaining appearance. Historically, radiotherapy was one of the main treatment methods for certain types of oral cancer, especially early lesions. However, the particularity of this region and the limitations of radiotherapy itself have promoted the continuous innovation and development of surgical treatment [1]. Currently, surgical treatment has become the preferred or core treatment method for most solid oral and maxillofacial tumors, especially malignant ones, due to its advantages of achieving complete tumor resection, providing accurate pathological staging, and performing functional repair and reconstruction simultaneously. Therefore, exploring the clinical outcomes of surgical treatment for patients with oral and maxillofacial tumors is of great significance.

2. Existing problems of traditional radiotherapy methods

Radiotherapy is a physical therapy that relies on ionizing radiation for treatment. Its basic principle is to inhibit the proliferation of cancer cells by damaging the DNA structure of tumor cells, thereby achieving clinical cure. In the multidisciplinary combined treatment system of oral and maxillofacial malignant tumors, although traditional radiotherapy can partially change the trend of disease progression, due to the complex anatomical structure and high tissue density of this region, conventional radiotherapy is difficult to achieve precise irradiation positioning, leading to various risks and challenges. These problems are mainly manifested in the following aspects.

2.1. Poor postoperative local tissue function recovery

The oral and maxillofacial region contains various sensitive tissue systems, mainly involving core parts such as nerves, blood vessels, muscles, and glands. Traditional radiotherapy is difficult to accurately avoid surrounding normal structures, easily causing regional hemorrhage, edema, or fibrosis, and reducing the speed of body function recovery; if oral glands are damaged, symptoms such as secretory disorders, thirst, and dry lips will occur, bringing great inconvenience to patients' eating and speech. In addition, damage to muscle tissue can also result in limited mouth opening and weakened masticatory muscle strength. For the nervous system, in addition to affecting facial sensory function, symptoms such as hyperalgesia can also occur, seriously affecting the quality of life of patients after surgery. The damage caused by the above radiation is often irreversible and will persist after the end of radiotherapy. Relevant organs still cannot return to normal physiological functions, which long-term damages the patient's physical health [2].

2.2. Insufficient treatment accuracy and limited local control effect

Traditional radiotherapy locates and delineates the target area based on imaging information, making it difficult to distinguish the boundary between tumors and surrounding normal tissues, resulting in a large irradiation field that damages normal tissue cells with uneven dose distribution; at the same time, the irradiation dose received by local lesions is insufficient to achieve a curative effect. For head and neck tumors with deep and complex shapes, the existing means still have deficiencies in radiation energy and accuracy, resulting in the irradiation field not fully covering the target area and reducing the local control rate; some cancer cells are resistant to ionizing radiation, thereby reducing the effectiveness of conventional treatment and leading to poor prognosis of patients [3].

2.3. Adverse effects on patients' long-term prognosis and function preservation

Long-term prognosis and function preservation are important indicators for evaluating the treatment effect of oral and maxillofacial tumors. Due to the significant damage to normal tissues caused by traditional radiotherapy, it will not only lead to various functional disorders in patients after surgery but also trigger a series of long-term complications, such as osteoradionecrosis, radiation caries, and facial soft tissue atrophy. These complications will further aggravate the patient's damage and affect the patient's long-term quality of life [4]. The local control effect of traditional radiotherapy is limited, and the tumor recurrence rate is relatively high. The treatment of recurrent tumors is more difficult, and the patient's survival rate will also decrease significantly. The destruction of facial appearance and functional disorders will also bring a serious psychological burden to patients, causing psychological problems such as anxiety and depression, which affect the patient's treatment compliance and long-term prognosis.

3. Optimization strategies for surgical treatment of patients with oral and maxillofacial tumors

To overcome the drawbacks of traditional treatment methods and enhance the diagnosis and treatment effect of oral and maxillofacial tumors, systematic improvement and strengthening should be carried out for the current treatment steps from three key nodes: preoperative evaluation, surgical operation, and postoperative management, to realize the full combination of precision medicine and efficient recovery.

3.1. Preoperative precision evaluation and personalized surgical plan formulation

Preoperative precise evaluation is the key basis for formulating personalized surgical plans and the core guarantee for improving treatment effects. During evaluation, multimodal imaging examination technology should be used to comprehensively analyze the anatomical characteristics, location, size, shape, infiltration degree, and regional lymph node metastasis of the tumor, combined with various factors such as the patient's overall health status. Currently, commonly used technical means include oral and maxillofacial CT, MRI, and ultrasound imaging. CT and MRI can accurately show the spatial relationship between the tumor and surrounding structures and its extension range; ultrasound is suitable for detecting cervical lymph node status; pathological biopsy can determine the histological type and differentiation degree, providing a reliable basis for clinical decisions [5]. Based on precise evaluation, an individual surgical plan should be established according to the patient's individual situation. If the tumor is small in size and limited in infiltration range, local resection can be adopted first to completely remove the lesion while preserving surrounding normal tissues and functional structures as much as possible; if the tumor is large in size and highly invasive, extended radical resection should be performed, and neck lymph node dissection should be combined if necessary to greatly reduce the recurrence rate; if the lesion involves important facial areas or key organ systems, functional protection and aesthetic repair needs should be considered in the initial design, and auxiliary means such as flap transfer and bone reconstruction should be arranged in advance to achieve both postoperative appearance optimization and physiological function recovery. In addition, age factors and other possible health risks should be considered, the risks related to surgery should be comprehensively weighed, and targeted interventions should be implemented to effectively ensure the safety of diagnosis and treatment and the achievement of expected curative effects [6].

3.2. Intraoperative precision operation and integrated application of minimally invasive technology

Precise surgical operation is a key factor in improving clinical efficacy and reducing tissue damage. During diagnosis and treatment, advanced equipment and technical means should be used to perform precise resection of tumor lesions, and efforts should be made to protect the safety of adjacent normal tissues and important neurovascular structures. For example, the intraoperative navigation system can real-time feedback the spatial positional relationship of instruments, providing efficient positioning assistance for surgeons and preventing operational errors due to visual limitations; intraoperative frozen pathological examination can determine whether the margin status meets the standards in a short time, so as to ensure the complete removal of cancerous parts, thereby greatly reducing the possibility of local recurrence. The use of minimally invasive technology not only reduces the scope of surgical wounds but also improves the efficiency of patients' postoperative recovery [7]. Currently, this technology is widely used in the treatment of oral and maxillofacial tumors and is gradually expanding towards diverse directions such as endoscopic assistance and robotic intervention. Precise operation

with endoscopes shows unique advantages in tumor resection in complex anatomical regions due to its small incisions, excellent field of view, and low bleeding rate; robotic surgery performed with high-precision mechanical arms and high-definition imaging systems further improves the diagnosis and treatment effect and ensures operational safety with its excellent spatial positioning ability. During clinical operations, strict adherence to sterile principles should be followed to prevent infection risks, and the total operation time should be reduced through refined process design to prevent tissue ischemic damage and related complications [8].

3.3. Construction of a postoperative multidimensional rehabilitation management system

Postoperative rehabilitation management is a key link in tissue function recovery and improvement of patients' quality of life, which is of great significance. Clinically, a systematic management model including physiological regulation, psychological intervention, nutritional support, and other aspects should be established to provide theoretical support for the comprehensive rehabilitation of patients, and personalized nursing strategies should be implemented to achieve the best curative effect. In terms of rehabilitation medicine, personalized training plans should be formulated to comprehensively assess the patient's surgical type and postoperative recovery status [9]. For example, for individuals after oral and maxillofacial surgical reconstruction, special training such as masticatory muscle group exercise, swallowing function improvement, and articulatory organ coordination should be carried out in stages to promote the recovery of various functions to normal. If the patient is accompanied by symptoms such as local swelling and pain, measures such as alternating hot and cold therapy and ultrasonic physical therapy can be used to improve blood circulation and relieve discomfort. At the same time, the wound care process should be strictly followed, dressings should be changed regularly, the wound should be cleaned correctly, the wound healing status should be closely observed, and potential infections, bleeding, and other conditions should be detected and resolved as early as possible. In terms of psychological intervention, since oral and maxillofacial tumor surgery will affect the patient's facial appearance and physiological functions, it is easy to cause negative emotions such as anxiety, depression, and damaged self-esteem in patients [10]. Therefore, it is necessary to focus on doctor-patient communication, pay close attention to the patient's psychological changes, and provide personalized psychological support services in a timely manner; cases of treatment effects and successful rehabilitation of related diseases can be shown to patients to enhance their treatment confidence; it is recommended that the patient's family also pay more attention to and support the patient to help reduce postoperative stress reactions and promote the smooth progress of the postoperative recovery process [11]. In terms of nutritional support, postoperative patients are at risk of insufficient nutritional intake due to limited chewing and swallowing functions. A nutritional support plan should be formulated according to the individual recovery process. For example, in the early postoperative period, patients can be provided with liquid or semi-liquid diets, and adequate protein and vitamin supply should be ensured to facilitate wound healing and body rehabilitation; as the patient's physiological functions gradually improve, they can gradually transition to a normal diet mode. Health education and guidance should also be strengthened to avoid irritating foods such as spicy and hard foods, thereby reducing the risk of oral mucosal injury [12].

4. Clinical outcomes of surgical treatment for patients with oral and maxillofacial tumors

By implementing optimization strategies such as preoperative precision evaluation, intraoperative precision

operation combined with minimally invasive technology, and postoperative multidimensional rehabilitation management, the clinical outcomes of surgical treatment for patients with oral and maxillofacial tumors have been significantly improved, mainly reflected in various aspects such as postoperative tissue function recovery, postoperative complication rate, patient's quality of life, and psychological state.

4.1. Significant effect on postoperative tissue function recovery

The optimized surgical treatment plan relies on preoperative precise evaluation and personalized planning, which not only ensures the complete resection of tumor tissue but also preserves the patient's normal anatomical structure and physiological functions as much as possible. The application of precise technology and minimally invasive methods during the implementation process greatly reduces the risk of damage to important tissues such as surrounding nerves, blood vessels, and muscles, providing a solid guarantee for postoperative functional reconstruction. The subsequent formulated systematic rehabilitation exercise plan also promotes the effective recovery of functions such as chewing, swallowing, and speech [13]. Compared with traditional radiotherapy, this therapy has significantly improved the overall recovery effect of oral and maxillofacial functions. Most subjects can gradually achieve self-care in diet and recovery of language communication ability, maintaining good facial appearance characteristics, thereby greatly reducing the decline in quality of life caused by functional impairment.

4.2. Effective reduction in postoperative complication rate

Traditional radiotherapy causes significant damage to surrounding tissues, which is likely to lead to symptoms such as dry mouth, mucosal ulceration, limited mouth opening, and osteomyelitis. The updated surgical plan reduces trauma and infection to a lower level through intraoperative precise operation, maintenance of a strict sterile environment, and application of minimally invasive technology; under the established sound wound management and comprehensive follow-up mechanism after surgery, most potential disease risks can be detected and addressed early. This new plan can effectively reduce the incidence of complications. For common manifestations such as delayed wound healing, wound bleeding, or local swelling, they can be successfully controlled under professional and technical care. The patient's entire condition converges rapidly, the length of hospital stay is significantly reduced, and the feeling of mental fatigue is alleviated [14].

4.3. Significant improvement in patients' quality of life and psychological state

Quality of life and psychological state are key comprehensive indicators for evaluating the treatment effect of patients with oral and maxillofacial tumors. The optimized surgical treatment plan not only improves the patient's postoperative tissue function and reduces the incidence of complications but also provides psychological intervention and nutritional support after surgery, relieving the patient's negative psychological emotions such as anxiety and depression and improving the psychological state. With the gradual recovery of the patient's facial appearance and physiological functions, self-confidence is significantly enhanced, and they can face life with a more positive attitude. The recovery of normal physiological functions enables patients to re-participate in social activities such as social interaction and work, and their quality of life is improved. Compared with patients after traditional radiotherapy who have a low quality of life due to functional disorders and psychological problems, the overall quality of life of patients after surgical treatment has been qualitatively improved [15].

5. Conclusion

In summary, in the treatment pattern of oral and maxillofacial tumors, radiotherapy and surgical treatment each have their clear positions and indications. However, for resectable lesions, especially advanced lesions, modern surgical treatment has shown more definite tumor eradication ability, more proactive functional recovery strategies, and a more manageable complication spectrum compared with traditional radiotherapy through comprehensive optimization of its technology. With the continuous development of medical technology, more precise and minimally invasive surgical treatment technologies should be further explored, postoperative management plans should be improved, the treatment effect should be continuously enhanced, the clinical prognosis of patients should be improved, and the harm of the disease to patients' physical and mental health should be further reduced.

Disclosure statement

The author declares no conflict of interest.

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