

The Role and Challenges of Plastic Surgery in Post-burn Psychological Rehabilitation

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Abstract: Burns, a traumatic illness with a high disability rate, often have profound physiological and psychological impacts on patients. With the shift in medical paradigms, psychological rehabilitation has become an integral part of burn care. Plastic surgery not only plays a crucial role in restoring appearance and function in burn rehabilitation but also plays a crucial role in the patient's psychological reconstruction. This article discusses the role and challenges of plastic surgery in post-burn psychological rehabilitation, highlighting its positive contributions to appearance restoration, self-identity restoration, functional improvement, and doctor-patient communication. It also analyzes practical challenges, such as the blurred boundaries between medicine and psychology, the gap between patient expectations and reality, the social stigma associated with scars, and resource and institutional constraints. To enhance the depth of plastic surgery's involvement in psychological rehabilitation, this article proposes strategies such as establishing a collaborative mechanism between plastic surgery and psychology, introducing standardized psychological assessment tools and intervention processes, strengthening physician psychological communication training, building a social support system, and conducting integrated clinical research. The study concludes that plastic surgery holds irreplaceable value in post-burn psychological rehabilitation and that its deep integration with psychological rehabilitation should be promoted in the future to achieve both physical and psychological rehabilitation for patients and comprehensively enhance the quality of burn rehabilitation and the level of humanistic care.

Keywords: Burn rehabilitation, Plastic surgery, Psychological rehabilitation, Appearance reconstruction, Doctor-patient communication, Multidisciplinary collaboration.

1. Introduction

Burns are a common and serious type of trauma, characterized by high disability rates, high treatment costs, and long recovery periods [1]. According to statistics from the World Health Organization, approximately 18 million people worldwide receive treatment for burns each year, among whom patients with severe burns often suffer from functional impairment, changes in appearance, and psychological trauma [2]. With the development of modern medicine, first aid and life support technologies for burns have continued to advance, and the survival rate of patients has significantly improved. However, the problems of functional recovery and psychological rehabilitation after wound healing have become increasingly prominent and have become key factors affecting the quality of life of patients. Burns not only damage skin tissue, but also have a profound impact on the patient's psychology. Studies have shown that common psychological problems in burn patients include post-traumatic stress disorder (PTSD), anxiety, depression, inferiority, and social disorders. In particular, burns on exposed parts of the body, such as the face and hands, are more likely to cause appearance anxiety and social withdrawal. Children and adolescent burn patients who experience trauma during their psychological development stage may suffer from personality development stagnation; while adult patients may experience psychological crises due to career restrictions and changes in family roles [3]. Therefore, psychological rehabilitation after burns has become an important and important part of the clinical rehabilitation system that cannot be ignored. Plastic surgery has traditionally been responsible for wound repair, scar reduction, and functional reconstruction in burn treatment, with its core goal being to improve appearance and restore function [4]. However, as the medical model shifts from "biomedical" to "bio-psycho-social", the role of plastic surgery has also been quietly expanding. Appearance

reconstruction is not only a physiological repair, but also the starting point of psychological reconstruction. Plastic surgeons' communication with patients before and after surgery, guidance on patients' expectations, and intervention in appearance anxiety all play a potential and important role in psychological rehabilitation [5].

2. Overview of Psychological Impacts after Burns

Burns not only damage skin tissue, but also have a profound impact on patients' appearance, function, and social role. Severe burns often lead to scars, deformities, and pigmentation, especially injuries to exposed areas such as the face and hands, which directly affect patients' self-identity and social interaction ability. In addition, burns may cause functional disorders such as joint contractures and limited mobility, interfering with daily life and occupational ability, and causing patients to face identity changes and social role reconstruction during the rehabilitation process [6]. These physiological and social changes are often accompanied by significant psychological impact, manifested as negative emotions such as anxiety, depression, inferiority, and social avoidance. In severe cases, post-traumatic stress disorder (PTSD) or suicidal tendencies may even occur [7]. Burn patients of different age groups have significant differences in psychological reactions and rehabilitation needs. Children are not yet fully developed and are prone to fear, attachment disorders, and behavioral regression. They need to focus on building a sense of security and family support. Adolescent patients have increased self-awareness, significant appearance anxiety, and social pressure, and often face identity crises. Adult patients are more likely to experience depression, family conflicts, and occupational anxiety due to social responsibilities and occupational pressure. Therefore, psychological rehabilitation should be individualized

according to the patient's age, burn site, and social background [8].

The goal of psychological rehabilitation after burns is to help patients restore psychological balance, rebuild self-identity, and improve their quality of life. Commonly used assessment indicators include psychological assessment tools such as PHQ-9, GAD-7, and PTSD scale, as well as quality of life scales such as SF-36 and WHOQOL-BREF. Functional recovery, social participation, and subjective patient satisfaction are also important reference indicators [9]. Through systematic evaluation and multidisciplinary collaboration, psychological rehabilitation can effectively promote the comprehensive recovery of patients and provide a solid guarantee for their return to society and resumption of normal life [10].

3. The Role of Plastic Surgery in Psychological Rehabilitation

Burn patients often suffer from deep psychological trauma after experiencing severe physical trauma. Plastic surgery not only plays a key role in appearance and functional restoration, but also plays an irreplaceable role in the psychological rehabilitation process of patients. Through multi-dimensional interventions such as appearance reconstruction, functional restoration, and doctor-patient communication, plastic surgery provides solid support for patients to rebuild their self-identity, improve their quality of life, and enhance their social adaptability.

3.1 Appearance Reconstruction and Self-identity Restoration

Burns often affect exposed parts such as the face and hands, causing obvious scars, deformities, and even tissue defects. These appearance injuries not only affect the patient's appearance, but also have a profound impact on their self-esteem and self-identity [11]. Appearance is an important part of an individual's identity. Especially in adolescents and young patients, changes in appearance often cause strong shame, social avoidance, and even self-denial. Plastic surgery can significantly improve the patient's appearance through scar resection, flap transplantation, tissue expansion, laser treatment, and other technical means, so that they can rebuild a positive perception of their own body [12]. In particular, the restoration of facial features and hand functions not only improves patients' mirror satisfaction, but also enhances their social confidence and reduces the inferiority and isolation caused by abnormal appearance. In addition, the improvement of appearance is of great significance in improving patients' "social acceptability". Society's evaluation of appearance often affects an individual's social status and interpersonal relationships. Burn patients often encounter discrimination, prejudice and even rejection due to their abnormal appearance [13]. Plastic surgery "eliminates" these social labels to a certain extent, making patients more easily accepted by society, thereby promoting their social participation and interpersonal communication. This restoration of social recognition has a positive effect on patients' psychological rehabilitation and is one of the core values of plastic surgery in psychological support. It is worth noting that appearance reconstruction is not only a technical issue, but also involves

the patient's cognitive reconstruction of "self". Plastic surgeons need to have a deep understanding of patients' psychological needs and expectations before surgery, help them establish reasonable aesthetic standards and rehabilitation goals, and avoid a sense of loss due to the postoperative effect not meeting expectations [14]. After surgery, they should continue to pay attention to the patient's adaptation process to their own image, and intervene in conjunction with the psychological department when necessary to achieve simultaneous reconstruction of appearance and psychology.

3.2 Functional Reconstruction and Improvement of Quality of Life

Burns are often accompanied by functional disorders, such as joint contracture, tendon adhesion, and limited mobility, which seriously affect the patient's daily life and occupational ability. In particular, patients with hand burns are often unable to complete basic life tasks due to limited fine motor skills, which leads to increased dependence and decreased self-efficacy, thereby increasing the psychological burden. Plastic surgery can effectively improve limb function and enhance the patient's ability to move independently through functional reconstruction surgeries, such as joint release, tendon transplantation, flap coverage, and nerve repair. This functional recovery not only improves the quality of life, but also indirectly relieves the patient's anxiety and depression and enhances their confidence in the rehabilitation process [15]. The synergistic effect of surgical treatment and rehabilitation training is the key to achieving patient independence. Plastic surgeons work closely with rehabilitation therapists to develop individualized rehabilitation plans so that patients can gradually resume their daily activities after surgery [16]. Every functional improvement in the rehabilitation process is an important node in the patient's psychological reconstruction. The improvement of independence not only enhances the patient's self-efficacy, but also helps them reintegrate into society and achieve both psychological and physical rehabilitation [17]. In addition, functional recovery also affects the patient's career reconstruction and economic independence. Some patients lose their original working ability due to burns and face career transformation or even unemployment. Plastic surgery should pay attention to the patient's career needs in functional reconstruction, and combine rehabilitation and career guidance departments to help them achieve the recovery of their working ability and re-employment. This kind of social function reconstruction has far-reaching significance for the patient's psychological rehabilitation and is an important extension of plastic surgery intervention psychological support [18].

3.3 Communication and Psychological Support

Plastic surgeons play an important role in psychological support in preoperative and postoperative communication. Preoperative communication not only involves the introduction of the surgical plan, but also should pay attention to the patient's psychological state and expectation management [19]. Through in-depth communication, doctors can understand the patient's emotional fluctuations, psychological needs and social background, help them

establish reasonable expectations, and reduce postoperative loss and anxiety. After surgery, it is necessary to continue to pay attention to the patient's emotional changes, provide psychological counseling and encouragement in a timely manner, and enhance their belief in recovery. Plastic surgery often requires multiple stages, and the recovery period is long. Patients are prone to fatigue and frustration during the process [20]. The doctor's positive feedback, patient explanation and emotional support can significantly improve the patient's treatment compliance and psychological resilience. A good doctor-patient relationship is an important guarantee for the patient's psychological recovery. The doctor's empathy, respect and patient listening can significantly improve the patient's sense of security and trust, and reduce resistance and loneliness during the treatment process. Plastic surgeons are not only technical executors, but also assistants in psychological rehabilitation. Through effective communication and emotional support, they build a positive rehabilitation environment for patients and promote their comprehensive recovery [21]. In addition, doctors should also pay attention to the patient's family support system during communication. The understanding and companionship of family members are crucial to the patient's psychological recovery. Plastic surgeons can communicate with family members to convey rehabilitation concepts and nursing points, enhance the family's support capacity, and form a rehabilitation network that collaborates with doctors, patients and families.

4. Challenges Faced by Plastic Surgery in Psychological Rehabilitation

With the continuous development of burn treatment concepts, the role of plastic surgery in the patient rehabilitation process has gradually expanded from simple functional and appearance restoration to psychological support and social adaptation. However, in actual clinical work, plastic surgery intervention in psychological rehabilitation still faces many challenges, including the boundary issues of professional capabilities, as well as the limitations of patients' psychological expectations, social environmental factors, and medical resource allocation.

4.1 Blurred Boundaries between Medicine and Psychology

Plastic surgeons mainly receive professional training centered on anatomy and surgical techniques in clinical work, and lack systematic learning of psychological knowledge. Although psychological aspects are inevitably involved in communication with patients before and after surgery, most doctors do not have professional psychological assessment and intervention capabilities, and it is difficult to identify patients' potential psychological problems, such as anxiety, depression, or post-traumatic stress disorder. This makes the intervention of plastic surgery in psychological rehabilitation often remain superficial, lacking depth and systematicity [22].

In addition, the multidisciplinary collaboration mechanism in the current medical system is still imperfect. The lack of information sharing and communication channels between plastic surgery and psychology and rehabilitation departments has led to difficulties in the simultaneous advancement of

psychological rehabilitation work for patients while undergoing plastic surgery. Some hospitals have not yet established a multidisciplinary team for burn rehabilitation, and psychological intervention often relies on the subjective judgment of individual doctors, lacking standardized processes and institutional guarantees. This blurred boundary and lack of collaboration have seriously restricted the role of plastic surgery in psychological rehabilitation [23].

4.2 Gap between Patient Expectations and Reality

After experiencing severe trauma, burn patients often have extremely high expectations for plastic surgery, especially the desire to "restore their original appearance." This expectation stems not only from the pursuit of beauty, but also from a strong need for self-identity and social acceptance. However, due to the depth, extent, degree of tissue damage and technical conditions of the burn, plastic surgery is often difficult to completely restore the original appearance. Even if the surgery achieves good medical results, the patient may still feel a sense of loss because the appearance does not match the "original self" in their memory. This gap between expectations and reality often becomes a trigger for postoperative psychological problems. Some patients experience anxiety, depression, anger, and other emotions after surgery, and even develop a sense of distrust towards doctors, which affects their cooperation with subsequent treatment. Therefore, preoperative psychological assessment and expectation management are particularly important. Plastic surgeons should not only explain the technical feasibility and risks of surgery to patients, but also help them establish reasonable psychological expectations to avoid increasing psychological burdens due to cognitive biases [24].

In addition, patients' psychological expectations are often affected by external factors, such as the promotion of "perfect repair" on social media, encouragement or pressure from relatives, etc. These factors may further amplify patients' expectations. Plastic surgeons need to have keen psychological insight in communication, identify patients' potential anxiety and unrealistic expectations, and help them establish a positive and rational attitude towards recovery through professional guidance.

4.3 Scars and Social Labels

Scars are not only physical marks, but may also become social labels, causing discrimination and exclusion. Burn patients often encounter strange looks due to changes in their appearance, and may even be restricted in job hunting, socializing, marriage, etc., which creates deep psychological pressure. Especially for patients with facial scars, they often feel ashamed and inferior due to their unusual appearance, and then avoid social activities, falling into a vicious cycle of loneliness and depression. Although plastic surgery can improve appearance to a certain extent, whether it can truly "eliminate" psychological trauma is still worth exploring. Appearance restoration is not equivalent to psychological rehabilitation. The patient's self-image recognition, social acceptance and emotional support system are the core of psychological reconstruction. Even if the appearance of some patients has improved significantly, they may still have psychological distress because their internal cognition has not

changed [25]. In addition, the society's cognition and attitude towards burn patients also affect their psychological rehabilitation process. The public's stereotypes about scars and the single standard of "beauty" put patients in a disadvantaged position in social interactions. While repairing scars, plastic surgery should pay attention to the patient's social adaptation and psychological reconstruction, and promote social tolerance and understanding of burn patients. By carrying out public education and establishing patient mutual aid organizations, a more friendly social environment can be created, which will help the continuous advancement of patients' psychological rehabilitation.

4.4 Resource and System Limitations

In the current medical system, the configuration of psychological rehabilitation services in burn plastic surgery departments is still insufficient. Most hospitals have not established a dedicated psychological rehabilitation team, and plastic surgeons find it difficult to take into account the psychological needs of patients in the heavy clinical work. The participation of psychological counselors often depends on the active coordination of individual departments, and there is a lack of institutional arrangements, resulting in insufficient coverage and sustainability of psychological intervention. In addition, the medical system does not attach enough importance to psychological rehabilitation, and the relevant policy support, funding and training system are not yet perfect. The status of psychological rehabilitation work in burn treatment has not been fully recognized, and there is a lack of clear support in clinical pathways, medical insurance reimbursement, performance appraisal, etc. [26].

This makes plastic surgery face multiple obstacles such as resource shortages, insufficient personnel, and institutional deficiencies in promoting psychological rehabilitation work. In this context, psychological intervention in plastic surgery often relies on personal experience and subjective judgment, making it difficult to form a standardized process, affecting the intervention effect and patient satisfaction. In the future, we should strengthen institutional construction, promote the routine configuration of psychological rehabilitation services in burn and plastic surgery departments, establish a multidisciplinary collaboration mechanism, and enhance the psychological recognition and communication capabilities of plastic surgeons, so as to achieve both physical and psychological rehabilitation of patients.

5. Response Strategies and Future Prospects

The role of plastic surgery in the psychological rehabilitation of burn patients is becoming increasingly prominent, but its development still faces multiple challenges, including blurred professional boundaries, insufficient resource allocation, and difficulty in managing patient expectations. In order to improve the depth and effectiveness of plastic surgery in psychological rehabilitation, it is urgent to formulate systematic response strategies from the aspects of system construction, talent training, and technology integration, and look forward to future development directions.

5.1 Establish a Collaborative Mechanism between Plastic Surgery and Psychology

Promoting multidisciplinary collaboration between plastic surgery and psychology is the key to improving the quality of psychological rehabilitation. Hospitals should establish a multidisciplinary team (MDT) for burn rehabilitation, incorporating plastic surgery, psychology, rehabilitation, and nursing into a unified management system to achieve information sharing and collaborative intervention. Before surgery, the psychology department will conduct a systematic assessment to identify the patient's psychological risks; after surgery, the plastic surgery and psychology departments will jointly develop a rehabilitation plan and continuously track the patient's emotional changes and adaptation process [27]. In addition, a regular interdisciplinary consultation mechanism should be established to jointly discuss complex cases and develop personalized treatment plans. Through institutionalized collaboration, we can break down departmental barriers, achieve seamless integration between plastic surgery and psychological intervention, and enhance patients' overall rehabilitation experience.

5.2 Introducing Psychological Assessment Tools and Intervention Processes

Introducing standardized psychological assessment tools such as PHQ-9 (depression scale), GAD-7 (anxiety scale), and PTSD screening questionnaires into the clinical pathway of plastic surgery can help identify patients' psychological problems early. The assessment results should be included in the medical record system as an important reference for formulating surgical plans and rehabilitation plans. At the same time, a preoperative and postoperative psychological intervention process should be established, including psychological counseling, cognitive behavioral therapy (CBT), group therapy, etc., to help patients cope with changes in appearance, functional impairment, and social pressure. The intervention process should be operational and continuous, avoiding "one-time" psychological support, and ensuring that patients receive stable psychological protection throughout the rehabilitation cycle [28].

5.3 Strengthening Psychological Communication Training for Plastic Surgeons

Plastic surgeons bear important communication and psychological support responsibilities in clinical work. Strengthening doctors' psychological communication skills training will help improve the quality of doctor-patient relationships and treatment compliance. The training content can include basic psychological knowledge, emotion recognition skills, empathy expression, expectation management strategies, etc., and simulated exercises can be conducted in combination with actual cases to enhance the practical ability of doctors. In addition, psychological communication skills should be included in the professional development evaluation system of doctors, and doctors should be encouraged to pay attention to the psychological needs of patients in addition to technical skills, forming a comprehensive treatment concept of "technology + humanity". Through continuous education and institutional incentives, the psychological support capabilities of plastic surgeons can be improved, and a warmer and more trusting treatment environment can be built for patients [29].

5.4 Promote the Construction of Social Support Systems

The psychological rehabilitation of patients not only depends on medical intervention, but also requires the participation of social support systems. Hospitals and social organizations should jointly establish a mutual assistance platform for burn patients, encourage patients to share their rehabilitation experiences, emotional distress and life strategies, and form a community atmosphere of mutual assistance, understanding and encouragement [30]. Public education should be strengthened to eliminate discrimination and prejudice against burn patients and increase social tolerance for scars and appearance differences. Through media publicity, public welfare activities, campus lectures, etc., a friendly social environment should be created to help patients better integrate into society and rebuild their self-identity.

Family support is also an important part of psychological rehabilitation. Hospitals can carry out family education programs to guide family members on how to understand patients' emotional changes, provide effective companionship and encouragement, and form a rehabilitation network for doctors, patients and families to collaborate [31]. 5.5 Conduct clinical research on the integration of plastic surgery and psychological rehabilitation. To promote the integrated development of plastic surgery and psychological rehabilitation, it is necessary to explore effective intervention models and evaluation systems based on clinical research. Research content may include the impact of preoperative psychological state on surgical satisfaction, the comparison of different intervention methods on rehabilitation effects, and the correlation between appearance improvement and social function recovery. Establish a database and follow-up system for burn rehabilitation, collect patients' physiological, psychological and social adaptation data, and form a multi-dimensional rehabilitation evaluation framework. Through evidence-based research, promote the standardization and scientific development of plastic surgery and psychological rehabilitation, and provide theoretical support for policy formulation and clinical practice [32]. In the future, it is also possible to explore the application of artificial intelligence and digital technology in psychological rehabilitation, such as developing psychological assessment apps, remote psychological counseling platforms, virtual reality assisted treatment systems, etc., to improve the accessibility and personalization of services.

6. Conclusion

Plastic surgery plays an irreplaceable role in psychological rehabilitation after burns. Through cosmetic reconstruction, functional restoration, and emotional support, plastic surgery not only helps patients rebuild their body image but also promotes self-identity, social adaptation, and emotional stability. However, in actual clinical practice, plastic surgery still faces multiple challenges in psychological rehabilitation, including limited professional capacity, insufficient resource allocation, and difficulties in managing patient expectations. To address these challenges, it is urgent to promote in-depth collaboration between plastic surgery and psychology, establish standardized psychological assessment and intervention processes, strengthen physician training in psychological communication skills, and build a

comprehensive social support system. At the same time, based on clinical research, new pathways for integrating plastic surgery and psychological rehabilitation should be explored to enhance the scientific and systematic nature of treatment. In the future, the in-depth integration of plastic surgery and psychological rehabilitation will become a key development direction for burn rehabilitation. Through interdisciplinary collaboration and institutional innovation, it will not only improve the overall quality of patient rehabilitation but also promote the implementation and development of humanistic medical care, realize the rehabilitation concept of "treating both body and mind," and provide burn patients with a more comprehensive and compassionate recovery journey.

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