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Research on Optimizing the Surgical Treatment Plan and Postoperative Refined Nursing Management of Keloids

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Abstract: Surgical resection is the core treatment for large, medium-sized, and refractory keloids. However, the recurrence rate of simple surgery remains high, and the standardization of perioperative nursing and postoperative management directly affects the treatment effect. Combining clinical nursing practice, this paper summarizes the key points of perioperative nursing for keloids, the optimization path of surgical plans, and multi-mode anti-recurrence nursing strategies, focusing on the core links of preoperative evaluation, intraoperative cooperation, postoperative wound care, tension control, recurrence monitoring, and psychological intervention. Research shows that refined surgical cooperation based on skin tension lines, anti-recurrence intervention within 24 hours after surgery combined with standardized nursing, and long-term dynamic follow-up can control the postoperative recurrence rate within 10%. This paper also analyzes the bottlenecks in postoperative nursing diagnosis and treatment, proposes optimization measures, and provides evidence-based reference for constructing an integrated perioperative nursing plan.

Keywords: Keloid; Surgical treatment; Perioperative nursing; Postoperative management; Recurrence prevention; Refined nursing

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1. Introduction

Keloids are pathological scars characterized by abnormal proliferation of dermal fibrous tissue, manifested as invasive growth beyond the scope of the original injury and continuous proliferation, accompanied by discomfort such as itching and stinging, which seriously affect the patient's appearance and quality of life, and are genetically susceptible and highly recurrent [1]. At present, the clinical consensus of "surgery as the foundation, combined treatment as the core, and postoperative nursing as the guarantee" has been formed [2]. However, the recurrence rate of single surgery is as high as 45–100% [3]. Perioperative nursing omissions, delayed anti-recurrence intervention, and insufficient patient compliance are important inducements for recurrence.

Clinical nursing runs through the entire diagnosis and treatment process of keloids. Preoperative evaluation, intraoperative cooperation, postoperative nursing, and long-term follow-up all directly affect the surgical effect and recurrence risk. Combining domestic and foreign research and nursing guidelines from 2022 to 2025, this paper sorts out the optimization of perioperative nursing and postoperative refined management strategies, providing operational basis for clinical nurses and promoting the standardized and precise development of keloid nursing.

2. Preoperative nursing evaluation and plan optimization for keloids

2.1. Comprehensive preoperative nursing evaluation

Accurate preoperative evaluation is the premise of formulating personalized plans. Nurses need to conduct evaluations from four aspects: In terms of scar characteristics, clarify the location, size, texture, etc. High-tension areas such as the chest, shoulders, and earlobes have a high recurrence risk, so enhanced nursing plans need to be formulated [4]. In terms of physical condition, focus on monitoring blood glucose. Diabetic patients need to control fasting blood glucose below 7.0 mmol/L to avoid high glucose exacerbating postoperative inflammation [5]. Use the Vancouver Scar Scale to quantify the degree of scar hyperplasia, providing a baseline for postoperative effect evaluation [6]. At the same time, evaluate the patient's psychological state and nursing compliance. Most scar patients are accompanied by anxiety and inferiority. Low compliance is an important risk factor for postoperative recurrence, so high-risk groups need to be identified in advance and guidance plans formulated [7].

2.2. Preoperative patient stratification and personalized intervention

Stratified nursing is implemented based on evaluation results. Intensive intervention is adopted for high-recurrence risk groups (high-tension areas, positive family history, diabetic patients): Conduct special health education to clarify nursing points and recurrence risks; Assist in completing serum TGF-β1 and hydroxyproline detection to provide reference for surgical timing and nursing monitoring [8]. For patients with severe anxiety, implement cognitive-behavioral intervention in conjunction with the psychology department. Routine preoperative nursing includes cleaning and skin preparation of the surgical area, position training, and informing patients of the surgical process and coping methods for discomfort to alleviate preoperative fear [9].

3. Surgical cooperation and intraoperative nursing key points for keloids

3.1. Refined surgical nursing cooperation

Minimally invasive and tension-free are the core to reducing postoperative recurrence. Nurses need to cooperate meticulously throughout the process: Prepare special instruments for minimally invasive surgery before operation to ensure sterility and precision; Cooperate with the surgeon to confirm Langer's skin tension lines during operation to ensure the incision follows the tension lines [10]. During subcutaneous tension-reducing suture, timely deliver materials and adjust tension to ensure tension-free alignment of the epidermis. For trephine volume reduction surgery, assist in controlling the depth and scope of the trephine, retain the normal superficial skin, and perform intraoperative hemostasis well to reduce surgical trauma [11].

3.2. Intraoperative trauma control and inflammation prevention

The core of intraoperative nursing is to reduce traumatic inflammation. Cooperate with the surgeon to strictly control the resection range, only resect scar tissue, and avoid damaging normal tissue; Timely clean the wound to reduce residual tissue debris and foreign body reaction; Provide moisturizing protection for large-area wounds to reduce postoperative inflammatory exudation. At the same time, monitor the patient's vital signs throughout the process, handle adverse reactions in a timely manner, and ensure the smooth progress of the operation.

4. Postoperative refined nursing and anti-recurrence intervention for keloids

4.1. Standardized postoperative wound care

Wound care is the foundation of postoperative rehabilitation. Keep the wound dry and avoid water for 6–8 hours after minimally invasive surgery; Change the dressing for the first time 1–3 days after surgical incision, cover with sterile dressing until suture removal. Suture removal is 5–7 days for the head and face, and 10–14 days for the trunk and limbs. The use of silver ion antibacterial dressings is recommended, which reduces the postoperative infection rate from 8% to 2.5% [12]. Closely observe the wound during dressing change and handle abnormalities such as redness and exudation in a timely manner. Use silicone preparations promptly after suture removal to inhibit fibroblast proliferation, guide patients to apply them regularly, and ensure uniform coverage of the drug.

4.2. Postoperative tension control and physical-chemical protection nursing

High tension is an independent risk factor for scar hyperplasia and recurrence. Immediately apply elastic bandage compression dressing after operation, maintaining a pressure of 15–25 mmHg [5]. Customize pressure garments/pressure earrings for high-tension areas. Wearing customized earrings for ear keloids can reduce the recurrence risk by more than 50% [13]. Guide patients to wear them for ≥ 20 hours a day for 3–6 months, and inform them of cleaning and maintenance methods. The 3 months after operation is the peak period of scar hyperplasia. Guide patients to apply sunscreen with SPF30 + PA +++ twice a day to do a good job in sun protection; The diet should be high in protein and vitamins, avoid spicy and irritating foods, and at the same time avoid excessive activities in the surgical area to reduce incision tension.

4.3. Nursing cooperation in postoperative combined anti-recurrence treatment

Surgery combined with anti-recurrence treatment is the key to reducing the recurrence rate. The 24 hours after operation is the "golden time" for radiotherapy and drug injection [14]. Assist doctors in completing the first intralesional hormone injection, guide patients to cooperate with radiotherapy, and observe and handle adverse reactions such as radiation dermatitis. For patients receiving hormone combined with 5-fluorouracil injection, prepare drugs strictly in accordance with medical advice, controlling the dosage and depth; For patients undergoing fractional laser treatment, clean the skin before operation, apply cold compress and moisturize after operation, and record the treatment situation throughout the process to ensure standardized completion.

4.4. Postoperative psychological nursing and health guidance

Patients still have appearance anxiety after operation, and long-term treatment is prone to burnout [7].

Continuous psychological nursing is needed: Timely feedback the wound healing situation and positively guide to alleviate anxiety; Communicate the psychological state regularly and timely counsel patients with negative emotions. Formulate personalized health guidance plans, guide patients to master skills such as wound care and pressure device wearing through oral explanation + graphic manuals + video demonstrations; Clarify early signs of recurrence (redness and itching, slight protrusion, hardening texture), and inform patients to seek medical attention immediately when signs appear [15].

5. Postoperative dynamic follow-up and early recurrence intervention for keloids

5.1. Construction of a standardized postoperative follow-up system

Dynamic follow-up is the core of early recurrence intervention. Construct a follow-up system of "1, 3, 6, 12 months", followed by annual follow-up. Adopt a combination of outpatient, telephone, and online methods: Outpatient follow-up evaluates the degree of hyperplasia through the Vancouver Scar Scale and detects serum hydroxyproline; Telephone and online follow-up focus on understanding self-care, wearing of pressure devices, and signs of recurrence. Establish exclusive follow-up files for patients, recording surgery, treatment, nursing, and follow-up results to achieve full traceability.

5.2. Early recurrence intervention and nursing adjustment

When early signs of recurrence are found during follow-up, immediately start hierarchical intervention [15]. Mild recurrence adopts hormone injection combined with fractional laser, strengthening the use of pressure and silicone preparations; Moderate recurrence adds radiotherapy and adjusts pressure device parameters; Severe recurrence assists in implementing secondary minimally invasive volume reduction surgery and re-formulates nursing plans. Analyze the inducements for recurrent patients, adjust nursing plans targeted, strengthen health guidance and psychological counseling, improve self-care ability, and reduce the risk of re-recurrence.

6. Existing problems and optimization strategies in postoperative nursing of keloids

6.1. Current bottlenecks in clinical nursing

Although refined nursing can reduce the recurrence rate, there are still shortcomings in clinical nursing: Insufficient intervention for high-recurrence risk groups, the recurrence rate of patients with chest keloids and positive family history is still 15–20% ; Patients' nursing compliance is low, and they arbitrarily interrupt nursing due to discomfort of pressure devices and cumbersome treatment; The professional ability of grass-roots nurses is uneven, and they have insufficient grasp of scar pathology and key points of anti-recurrence nursing; Lack of personalized nursing plans, most adopt unified standards, and do not formulate plans combined with patients' individual conditions.

6.2. Clinical nursing optimization strategies

First, carry out specialized nursing training, focusing on scar pathology, perioperative nursing, recurrence identification, etc., and only those who pass the assessment can engage in specialized nursing; Second, construct personalized nursing plans, formulate "one person, one plan" based on scar location, recurrence

risk, psychological state, etc., and strengthen intervention for high-risk groups; Third, innovate health guidance methods, improve patients' compliance through online check-in and regular reminders, simplify nursing processes, develop convenient tools, and reduce nursing difficulty; Fourth, establish a multi-disciplinary collaboration model, combining surgery, dermatology, and psychology to provide patients with comprehensive physical and psychological integrated diagnosis, treatment, and nursing services.

7. Conclusion

The effect of surgical treatment for keloids depends on an integrated model of "precision surgery + standardized perioperative nursing + long-term anti-recurrence management" and clinical nursing occupies a core position throughout the process. Preoperative evaluation, intraoperative cooperation, postoperative nursing, and long-term follow-up need to follow the principles of precision and standardization, and each link is interlocking to effectively reduce the recurrence rate.

At present, clinical practice needs to address nursing bottlenecks, strengthen the construction of specialized nursing capabilities, construct personalized nursing plans, improve patient compliance, and achieve continuous improvement of nursing quality through multi-disciplinary collaboration. In the future, with the development of molecular targeted therapy and intelligent diagnosis and treatment technology, clinical nursing needs to integrate new diagnosis and treatment concepts, combine precision nursing with new technologies, further reduce the postoperative recurrence rate, improve patients' quality of life, and provide a new direction for the development of clinical nursing for keloids.

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