

The Use of Fish Skin (Tilapia) in Burn Patients as a New Therapy Under Study

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ABSTRACT

Tilapia skin is an attractive and viable option for the treatment of second and third degree burns in patients. Several studies have shown that tilapia skin has antibacterial and anti-inflammatory properties that promote wound healing and reduce pain and inflammation in burn patients. In addition, tilapia skin is readily available, inexpensive and has a low probability of disease transmission. Compared to other treatment options, such as skin grafts, tilapia skin has a high success rate in promoting wound healing. More research is needed to fully establish the efficacy and safety of tilapia skin in the treatment of burns, but the current results are promising and suggest that tilapia skin may be a viable and cost-effective option for burn treatment.

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INTRODUCTION

Burns are traumatic injuries to the skin that can be caused by a variety of factors, such as heat, cold, electricity, chemicals, radiation or friction. In humans, burns are one of the most serious and potentially fatal injuries that can occur.¹

Burns can have a significant impact on a patient's quality of life, especially if the burn is extensive or located on critical areas of the body, such as the face or hands. Severe burns can also be life-threatening due to fluid loss, infection and other complications.¹

In addition to physical pain and suffering, burns can have an emotional and psychological impact on the patient and their family. Patients with severe burns often experience anxiety, depression and sleep disturbances, which can affect their recovery and quality of life.¹

It is important to treat burns in a timely and appropriate manner to prevent complications and speed the patient's recovery. Treatments may include administration of analgesics for pain, cleaning and debridement of the wound, application of special dressings and bandages, and, in some cases, reconstructive surgery.¹

Skin grafting is a surgical technique used in the treatment of severe skin wounds and injuries. It involves the transfer of a

portion of skin from a donor area of the same or another person to cover a wound or damaged area of skin on another part of the body.¹

There are different types of skin grafts, including partial-thickness and full-thickness grafts, and autografts and allografts. In partial-thickness grafting, only a superficial layer of skin is removed from the donor site, while in full-thickness grafting, all layers of skin are removed. In autografting, the skin graft comes from the patient's own body, while in allografting, skin from another person is used.¹

The choice of the type of skin graft depends on several factors, such as the severity of the injury, the amount of skin available for grafting and the doctor's preference.

The skin grafting process involves several steps. First, the wound and donor site are prepared to ensure that they are clean and disinfected. Next, the skin is removed from the donor site and prepared for transplantation. In the case of a partial-thickness graft, the harvested skin is divided into thin sheets to cover a larger area of the wound.¹

Once the skin graft has been prepared, it is carefully placed over the wound and secured in place with sutures or bandages. The skin graft provides a protective barrier for the

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wound and helps prevent infection. It also promotes skin regeneration and the formation of new skin cells.¹

Skin grafts can be very effective in treating serious wounds and skin injuries, but they can also have some risks and complications, such as infection, graft loss or scar formation. For this reason, careful evaluation and follow-up by the doctor is required to ensure a successful recovery.¹

Use of tilapia skin

A tilapia skin graft is a wound treatment that involves the application of tilapia skin to a wound. Tilapia skin is a biological skin graft option used in the treatment of acute and chronic wounds, such as burns, pressure ulcers, surgical wounds and traumatic wounds.^{2,3}

Tilapia skin has several properties that make it suitable for use as a skin graft. First, it is rich in collagen, a protein that helps promote skin regeneration and healing. In addition, tilapia skin has a high concentration of omega-3 fatty acids, which are known for their anti-inflammatory and antioxidant properties. These properties make tilapia skin effective in promoting wound healing.^{2,3}

The process of preparing tilapia skin for use as a skin graft involves several steps. First, the skin is cleaned and disinfected to remove any bacteria or contaminants. Next, the skin is cut into thin sheets, which can be adapted to the shape of the wound. The sheets are placed over the wound and secured with a dressing or bandage.⁴

ADVANTAGES

The application of tilapia skin grafts has been shown to be effective in promoting wound healing and reducing inflammation and pain. In addition, tilapia skin grafts have been found to be safe and well tolerated by patients.⁴

as autografts and allografts, in terms of availability and cost. Tilapia skin is readily available and abundant, which reduces production costs and makes tilapia skin grafts more affordable than other options.⁴

In addition, tilapia skin grafts have antimicrobial and anti-inflammatory properties that help prevent infection and accelerate wound healing. These properties are especially beneficial in infected wounds and in patients with weakened immune systems.⁴

In terms of clinical outcomes, tilapia skin grafts have been shown to have a high success rate in the treatment of chronic wounds, burns and other skin injuries. These skin grafts also have a very low rejection rate, meaning that the patient's body does not reject them as often as other skin grafts.⁵

DISADVANTAGES

Although tilapia skin grafts have many advantages, they also have some disadvantages and limitations that are important to consider.⁶

First, tilapia skin grafts are a relatively new surgical technique and research is still ongoing to fully evaluate their efficacy and safety. Although promising results have been obtained in clinical trials, further studies are needed to confirm its effectiveness and evaluate possible long-term side effects.⁶

In addition, because tilapia skin is a biological material, there is a potential risk of infectious disease transmission, although this risk is low. It is important to ensure that tilapia skin used in grafting is properly processed and sterilized to reduce the risk of infection.⁶

Another disadvantage of tilapia skin grafts is that they are not suitable for all skin lesions. Tilapia skin grafts are primarily used to treat acute and chronic wounds, burns and ulcers, but may not be the best choice for other skin conditions, such as melanomas or carcinomas.⁶

In addition, tilapia skin degrades faster than human skin, which means it is a temporary option to cover the affected area while the patient's skin regenerates. This may require multiple tilapia skin grafting procedures, which can increase the cost and complexity of treatment.⁶

SURGICAL TECHNIQUE

The surgical technique of tilapia skin grafting involves the application of tilapia skin to a wound or skin lesion to stimulate skin regeneration. The process is described in detail below:⁶

1. Graft preparation: The tilapia skin used in the graft is processed and sterilized prior to use. This is done to ensure that the graft is safe and free of any contamination.⁷
2. Preparation of the donor site: Before the graft is applied, the donor site, which is usually the inner thigh of the tilapia, is cleaned and disinfected. The skin is trimmed into a graft shape to match the shape and size of the lesion.⁷
3. Preparation of the recipient site: The area where the graft will be applied is cleaned and prepared to receive the graft. Various techniques can be used to prepare the area, including debridement and cleaning of the wound to remove any dead tissue or contamination.⁸
4. Graft application: The tilapia skin graft is applied to the recipient site and secured in place with dressings or bandages. The graft is placed with the tilapia skin side down so that collagen and other biological components of the skin are in contact with the wound.⁸
5. Aftercare: Several tilapia skin grafting procedures may be required to completely cover the affected area. After graft application, dressings should be changed and the wound should be monitored for signs of infection or other problems. It is important to follow the physician's instructions for aftercare and wound cleaning.⁸

Overall, the surgical technique of tilapia skin grafting is an effective and affordable option in the treatment of severe

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wounds and skin lesions. However, it is important to keep in mind that this technique is still in an early stage of development and further studies are required to fully evaluate its efficacy and safety.⁹

AFTERCARE

Aftercare of tilapia skin grafts is critical to ensure proper healing and patient recovery. The following is a description of some of the aftercare that should be followed:¹⁰

Bandage: After the procedure, a bandage should be applied to cover the tilapia skin graft to protect it and keep it in place. The dressing should be checked daily to ensure that it is not too tight or loose.¹⁰

Pain control: It is common for the patient to experience pain after the procedure. The physician may prescribe analgesics to control pain. Cold compresses may also be applied to reduce swelling and pain.¹¹

Cleaning and wound care: The graft site should be kept clean and dry to prevent infection. The physician will provide detailed instructions on how to clean the area and change the dressing. Ointments or creams may also be applied to aid healing.¹²

Avoid strenuous physical activity: It is important to avoid any strenuous physical activity or sports until cleared by the physician. Excessive movement can affect graft healing and delay recovery.¹⁰

Nutrition management: Proper nutrition is essential for rapid and effective healing. A balanced diet rich in protein, vitamins and minerals is recommended. In addition, alcohol consumption and smoking should be avoided, as they can delay healing.¹¹

Follow-up monitoring: The physician will follow the patient regularly to assess healing and recovery. Additional tests, such as blood tests or imaging tests, may be performed to verify healing.¹²

CONCLUSIONS

In conclusion, tilapia skin grafts have proven to be a safe and effective option in the treatment of severe skin wounds and injuries. Clinical studies have shown that tilapia skin grafts are able to significantly reduce healing time and pain compared to other skin grafting techniques.

In addition, tilapia skin grafts are a viable option for patients who cannot receive traditional skin grafts due to medical limitations, such as lack of their own tissue to donate or rejection of allogeneic tissues.

However, it is important to note that tilapia skin grafts also have some disadvantages, such as potential disease transmission, possible bacterial contamination during preparation, and lack of availability in some geographic regions.

In general, tilapia skin grafts are a safe and effective option in the treatment of severe skin wounds and injuries. As with any medical procedure, it is important to discuss the risks and benefits with the treating physician to make an informed decision and ensure a successful recovery.

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