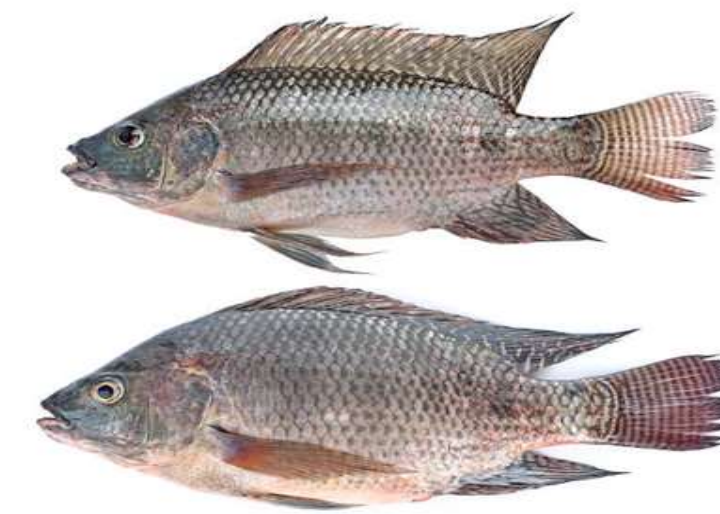
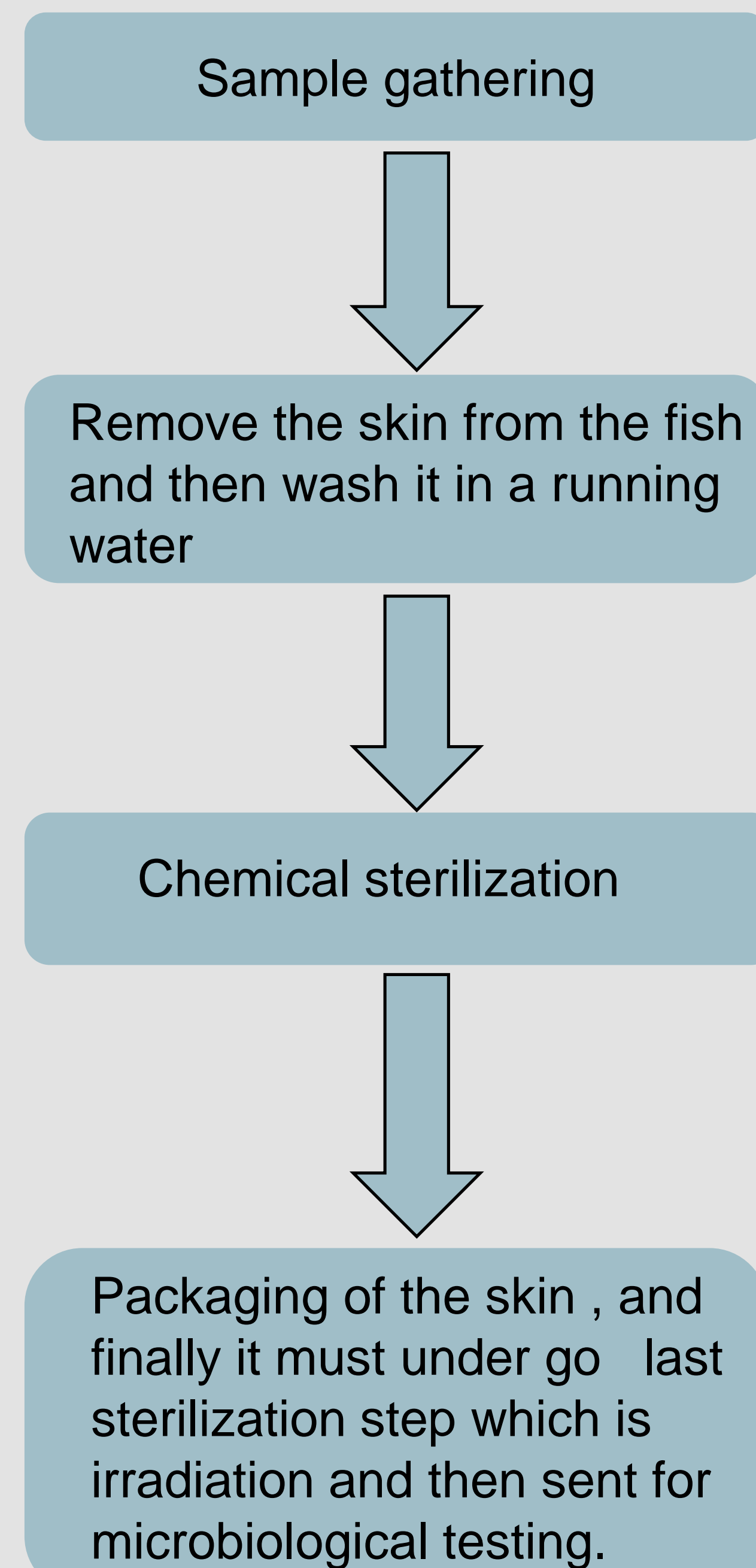


## Introduction

Burns are one of the most common and serious forms of trauma worldwide , The world health organization (WHO) recorded about 180,000 deaths annually caused by burns and most of the cases belongs to low and middle income countries.<sup>1</sup> Burn care have developed throughout the years , Nile Tilapia Fish Skin (NTFS) was suggested because the tilapia fish is cheap , available , high amounts of collagen type 1 in its skin and it histologically similar to the human skin.<sup>2</sup> Nile Tilapia (*Oreochromis niloticus*) belongs to the Cichlid family and originates from the Nile basin, in East Africa , and it is widespread throughout the world . The aim of this research is to show how the Nile Tilapia fish skin is used as a biological dressing and how it accelerates the process of wound healing.



## Materials and methods



## Case report

A three year old boy was admitted to the burn treatment center in Fortaleza, Brazil , and he was presented with burns in the left side of the face, neck, anterior thorax, abdomen, and left arm. This child acquired those severe burns at home due to direct contact with boiling water . After he was admitted to the hospital , the patient was stabilized as he received intravenous fluids . The consent from his parents was taken for application of the Nile tilapia skin as bandages to treat the child's burns.<sup>3</sup> Before applying the tilapia fish skin , the patients skin was sterilized using 0.9% saline for 5 minutes , this sterilization technique was repeated 3 times sequentially . The application of anesthesia, 0.5 mg of midazolam and 30 mg of ketamine to the patient , then cleaning the skin of the patient using tap water and 2% chlorhexidine gluconate and any blisters or necrotic tissue were removed and finally the tilapia skin was applied on the affected areas . Silver sulfadiazine cream 1% is applied to the face and neck of the patient because it is very difficult to attach the tilapia skin on those areas . The last step is to cover the whole scalded area using bandage and gauze.<sup>3</sup>



Figure A : The case was admitted to the burn treatment center.  
 Figure B : Appearance of the wound after cleaning and removal of the necrotic tissue and blisters.  
 Figure C : Appearance of the wound after the application of the tilapia skin.  
 Figure D : The dressing was opened for the first time ( on the sixth day ) .  
 Figure E : On the tenth day the tilapia skin was removed .  
 Figure F : The appearance of the wound one week after the dressing was removed.

Figures A - F adopted from *Journal of Burn Care & Research*.<sup>3</sup>

## Results

The signs and clinical conditions of the patient were evaluated every 6 hours , checking the gauze and bandage applied to patient every 24 hours for the presence of exudate. On the sixth day of the treatment , the patient received anesthesia again and the tilapia skin dressing was opened for the first time (the doctors noticed that the tilapia skin dressing was adherent firmly to the patient skin as this was an advantage ) . On the tenth day , the tilapia skin dressing is opened again and the results was more than perfect that the skin of the patient was harder and dried. The tilapia skin can be removed from the patient when there is a significant detachment of the fish skin from the wound borders and this detachment is the sign of the re-epithelialization. With a total of 10 days as this is the period required for complete re-epithelialization and finally the patient was discharged from the hospital. Happily there was no adverse reactions.<sup>3</sup>

## Discussion / Conclusion

Xenografts and allografts are both similar but the xenografts appear to be a better choice because of their reduced cost and more safety. The Nile tilapia skin morphology is very similar to the human skin that it has a deep dermis formed of thick collagen fibers organized as parallel , horizontal , transverse and vertical arrangement.<sup>3</sup> The tilapia skin has high resistance , rich in collagen type 1 , noninfectious microbiota are present too . And other study showed that the tilapia skin very good attachment to the affected burned areas of the rat's skin.<sup>3</sup> Another study showed perfect results as the marine collagen peptides from tilapia skin were applied to the burned skin of the rabbits. New study showed that the tilapia collagen promotes both the differentiation and proliferation of keratinocytes and fibroblasts.<sup>4</sup>

## References

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