CASE REPORT

Journal of Plastic Surgery and Transplantation
Volume 7 Number 1, January–June 2026

Autologous Whole Blood Clot Matrix in the Management of Second-Degree Burns

Rucha Palkritwar[1], Ravi Kumar Chittoria[2], Srinath Rajasekar[3], Tanya Gupta[4]

HOW TO CITE THIS ARTICLE:

Rucha Palkritwar, Ravi Kumar Chittoria, Srinath Rajasekar, et al. Autologous Whole Blood Clot Matrix in the Management of Second-Degree Burns. J of Pla Sur and Trans. 2026; 7(1): 19-22.

ABSTRACT

Second-degree (partial-thickness) burns constitute a significant proportion of burn injuries encountered in clinical practice. These are usually managed conservatively, yet delayed epithelialisation and suboptimal healing remain concerns. Autologous whole blood clot (AWBC) therapy has shown efficacy in chronic wounds, but evidence in acute burns is limited. We report a 46-year-old male with a second-degree superficial upper-limb burn treated with a point-of-care AWBC dressing following wound cleansing. The clot adhered well to the wound, maintained a moist environment, and acted as a stable biological cover. No adverse events were observed. Progressive epithelialisation with reduction in BJWAT score, good pain control, and absence of infection were noted. This case suggests that AWBC is a feasible and safe adjunct for second-degree superficial burns, warranting further evaluation in controlled studies.

KEYWORDS

• Blood clot • Superficial burns • matrix

INTRODUCTION

Second-degree superficial burns involve injury to the epidermis and superficial dermis and are commonly managed with conservative measures aimed at promoting rapid re-epithelialisation, preventing infection, and

AUTHOR'S AFFILIATION:

[1] Junior Resident, Department of Plastic Surgery, JIPMER, Pondicherry, India.

[2] Professor and Associate Dean (Academic), Head of IT Wing and Telemedicine, Department of Plastic Surgery and Telemedicine, JIPMER, Pondicherry, India.

[3] Senior Resident, Department of Plastic Surgery, JIPMER, Pondicherry, India.

[4] Senior Resident, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, India.

CORRESPONDING AUTHOR:

Ravi Kumar Chittoria, Professor and Associate Dean (Academic), Head of IT Wing and Telemedicine, Department of Plastic Surgery and Telemedicine, JIPMER, Puducherry, India.

E-mail: drchittoria@yahoo.com

➢ **Received :** 16-02-2026 ➢ **Accepted:** 19-03-2026

minimising pain and scarring. Although most superficial partial-thickness burns heal spontaneously, delayed epithelialisation and suboptimal scar quality remain concerns, particularly when functionally important regions such as the upper limb are involved.[1,2]

Autologous blood-derived therapies have gained increasing interest in wound care due to their ability to provide a provisional extracellular matrix (ECM), deliver endogenous growth factors, and modulate the wound microenvironment.[3,4] Autologous whole blood clot (AWBC), prepared at the point of care, has demonstrated safety and efficacy in the management of chronic wounds such as diabetic foot ulcers and pressure ulcers by recreating a functional ECM scaffold and facilitating progression through the normal phases of wound healing.[5,6]

However, literature describing the use of autologous blood clot therapy in acute burn wounds is limited.

METHODOLOGY

Autologous blood clot preparation was performed inside the operating theatre using the patient's peripheral venous blood. Approximately 15 mL of blood was collected and allowed to clot under controlled conditions, resulting in formation of a cohesive whole blood clot within minutes, as described in previous studies.[5,6] This was the placed on to the wound and covered with additional secondary foam and gauze dressings.

Figure 1: Patient wound on presentation

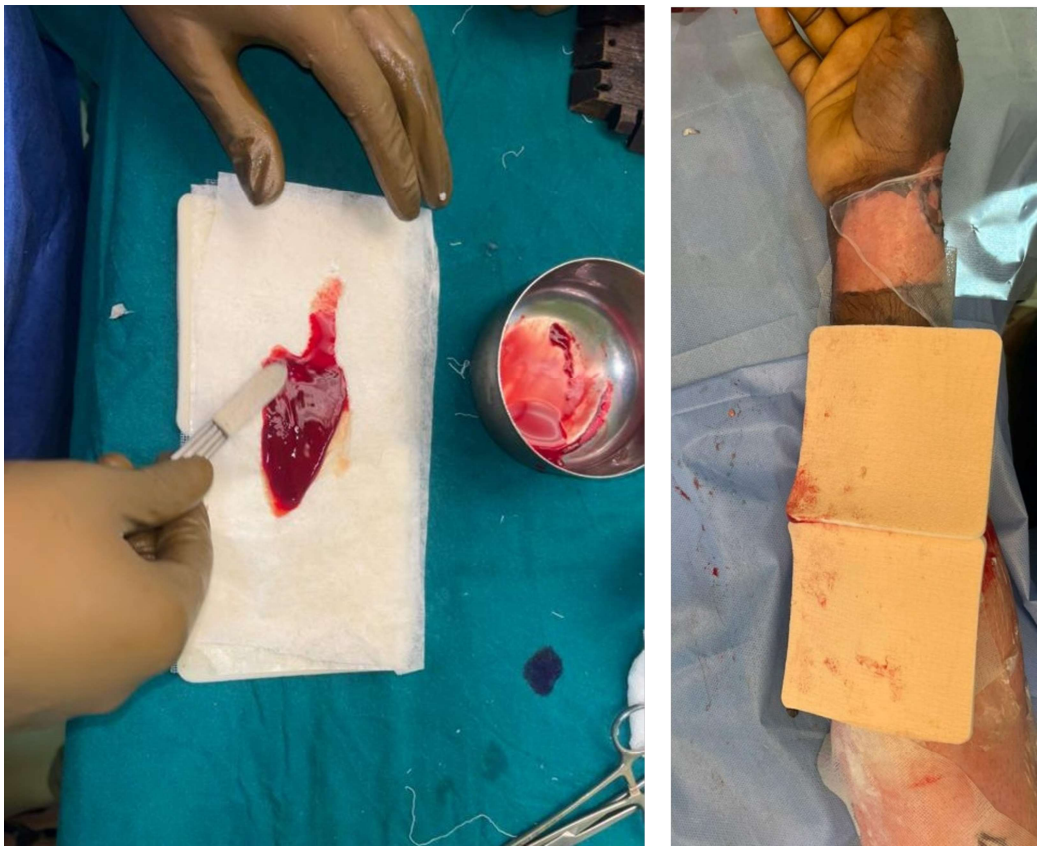

Figure 2: Preparation and Application of autologous blood clot matrix over a second-degree burn wound

RESULT

The wound was reviewed on day three and the BJWAT score was noted to have reduced from preoperative 18 to 16.

DISCUSSION

Superficial partial-thickness burns are commonly managed with topical agents and occlusive or semi-occlusive dressings aimed at maintaining a moist wound environment, preventing infection, and promoting rapid epithelialisation. Despite advances in burn wound care, delayed healing and pain remain relevant challenges.[1,2]

Autologous whole blood clot therapy represents a biologically rational approach to wound management. The clot acts as a provisional extracellular matrix scaffold rich in fibrin, fibronectin, platelets, leukocytes, and endogenous growth factors, closely mimicking the early phases of physiological wound healing.[3,4,7,8] This matrix supports keratinocyte migration, fibroblast proliferation, angiogenesis, and dynamic reciprocity between cells and their microenvironment.[4,8]

Although AWBC has been extensively studied in chronic wounds such as diabetic foot ulcers and pressure ulcers,[5,6] its application in acute burn wounds remains limited. In the present case, AWBC provided stable wound coverage, maintained a moist environment, and supported progressive epithelialisation without infection, findings consistent with earlier chronic wound studies.[5,6]

The autologous nature of the clot eliminates risks of immunogenicity and disease transmission while offering a low-cost, point-of-care biological dressing, making it particularly attractive in resource-limited settings.

CONCLUSIONS

Autologous blood clot therapy appears to be a feasible, safe, and biologically sound dressing option for second-degree superficial burns. By providing a provisional extracellular matrix rich in endogenous growth factors, AWBC supports rapid epithelialisation and favourable wound healing outcomes.[3,7]

REFERENCES

1. Singer A.J., Clark R.A. Cutaneous wound healing. N Engl J Med. 1999; 341(10): 738–746.
2. Guo S., DiPietro L.A. Factors affecting wound healing. J Dent Res. 2010; 89(3): 219–229.
3. Diegelmann R.F., Evans M.C. Wound healing: an overview of acute, fibrotic and delayed healing. Front Biosci. 2004; 9: 283–289.
4. Schultz G.S., Davidson J.M., Kirsner R.S., Bornstein P., Herman I.M. Dynamic reciprocity in the wound microenvironment. Wound Repair Regen. 2011; 19(2): 134–148.
5. Snyder R.J., Nouvong A., Ulloa J., Wahab N, Treadwell T, Bruwer F, *et al*. Efficacy and safety of autologous whole blood clot in diabetic foot ulcers: a randomised controlled trial. J Wound Care. 2024; 33(9): 688–699.
6. Landau Z., Whitacre K.L., Leewood C., Hawkins J., Wachuku CD. Utilization of a topical autologous blood clot for treatment of pressure ulcers. Int Wound J. 2023; 20(3): 806–812.
7. Barrientos S., Stojadinovic O., Golinko M.S., Brem H., Tomic-Canic M. Growth factors and cytokines in wound healing. Wound Repair Regen. 2008; 16(5): 585–601.
8. Werner S., Grose R. Regulation of wound healing by growth factors and cytokines. Physiol Rev. 2003; 83(3): 835–870.