

## Wound Care Therapy on Raw Surface after V-Y Advancement Flap: A Case Report

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### Abstract:

**Introduction:** The V-Y advancement flap (VYAF) can be used for trauma case of the head and neck and it is commonly used for reconstruction on the cheek or upper lip. This technique uses adjacent from the defect skin that matches in color and texture. Various wound care therapy is used to accelerate the healing process. This study aimed to demonstrate our experience of VYAF procedure for maxillofacial trauma case and combined with wound therapy at home can lead to favorable outcomes.

**Case Report:** A 41-year-old male patient presented with facial injuries after a motorcycle vehicle accident. Physical examination revealed skin loss, nasolabial penetrating wound, abrasive wounds on the facial area and facial asymmetry. From skull AP-Lateral X-ray revealed there is no signs of skull fracture. The patient underwent wound debridement, and VYAF procedure under local anesthetic. Wound care therapy at home included routine irrigation with antibacterial agent wound irrigation and NaCl solution, and applied wound gel. Clinical outcomes showed gradual improvement with reduced swelling, granulation tissue formation, and excellent wound healing over 15 days.

**Discussion:** The VYAF procedure with the Langer's line reference direction can minimize tension and maximize aesthetic outcomes. The application of wound care therapy, including routine irrigation solutions and gel to prevent biofilm, can be a favorable combination after surgical treatment. The limitation of this study is the lack of a comparison group using other types of wound care.

**Conclusion:** The VYAF procedure and wound care therapy for maxillofacial trauma can lead to excellent outcomes.

**Keywords:** antibacterial agent, langer's lines, soft tissue injury, V-Y advancement flap, wound therapy

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### Introduction

Facial reconstruction of soft tissue defects can be performed using primary closure, skin grafting, local flap, distant flap, or free flap techniques. The type of reconstruction

depends on various factors, such as the size and anatomical location of the defect, the patient's preference in aesthetic and

functional factors, and the condition of the surrounding tissues.[1,2]

Basic skin flaps that are often used in facial reconstruction procedures are advancement flap, rotational flap, transpositional flap, and microvascular anastomotic flap. Advancement flaps are technically characterized by sliding or stretching the flap skin along a vector with minimal tension, so this technique relies on skin elasticity and/or skin redundancy to facilitate good closure.[3–5]

The V-Y advancement flap (VYAF) can be used for trauma case of the head and neck and it is commonly used for reconstruction on the cheek or upper lip. [6] This procedure is relatively easier and can be one of the main options for facial reconstruction, as well as resulting in several advantages such as producing a similar quality of skin color and texture as this technique has the ability to use tissue located adjacent to the defect site. Another advantage is that the placement of the incision can be made in such a way as to camouflage the scar as it is placed in a less prominent area resulting in minimal scarring of the adjacent tissue.[1,6,7] After the facial reconstruction procedure with the V-Y advancement flap technique has been performed, the patient then proceeds to the postoperative rehabilitation and healing stages. Various wound care therapy can be used to accelerate the healing process. Wound care therapy is one of the most important parts of postoperative care. In addition to achieve rapid wound healing, the systematic application of wound care therapy (wound debridement, cleansing, and dressing) can also prevent potentially fatal septic complications and improve patients' quality of life with the best aesthetic and functional outcomes.[8,9] This study aimed to demonstrate our experience of VYAF procedure for maxillofacial trauma case and combined with wound therapy at home can lead to favorable outcomes.

## Case Report

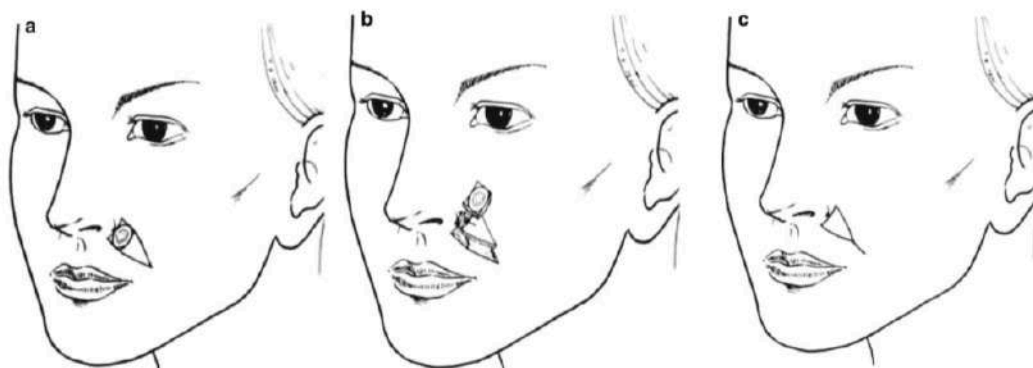
A 41-year-old male patient referred to Emergency Department, Dr. Hasan Sadikin General Hospital, Bandung, Indonesia with facial injuries after a motorcycle vehicle accident. The patient had no history of systemic disease, alcohol intoxication, drug or food allergy, no history of previous surgery and his family and psychosocial history were normal. Vital signs were within normal limits. Physical examination revealed skin loss, nasolabial penetrating wound with irregular border which measured 3×2 cm, abrasive wounds on the facial area and facial asymmetry. Skull AP-Lateral X-ray revealed there is no signs of skull fracture. The main diagnosis was mild head injury with punctum wound on the superior labii region, skin loss on the sinistra nasolabial region and multiple abrasive wounds on the facial region which had been sutured extraoral with the VY advancement flap and intraorally. The patient was given Ketorolac intravenously during the procedure and antibiotics (Cefadroxil Monohydrate) also Ibuprofen intraorally after the procedure. The patient underwent wound debridement, and V-Y advancement flap (VYAF) procedure under local anesthetic. During the first postoperative day (POD I), the patient was instructed to perform wound care therapy at home including routine irrigation with antibacterial agent wound irrigation and NaCl solution, and applied wound gel. On POD VII, the patient showed improvement with early signs of wound healing and was instructed to maintain wound care therapy until the next control visit. On POD XV, a follow-up was performed to evaluate the postoperative wound and sutures removal on extraoral and intraoral which still appeared to be in good condition. Clinical outcomes showed gradual improvement with significant reduced swelling, granulation tissue formation, and excellent wound healing. Prognosis was good and the patient did not report any adverse effects during the treatment period.



**Figure 1. Extraoral view of the patient**



**Figure 2. Skull AP-Lateral X-ray**



**Figure 3. Schematic picture for V-Y advancement flap (VYAF)**



**Figure 4. Wound debridement and V-Y advancement flap (VYAF) procedure under local anesthetic**



**Figure 5. Post-operative day VII (POD VII)**



**Figure 6. Post-operative day XV (POD XV) pre aff hecting**



**Figure 7. Post-operative day XV (POD XV) post suture removal**

## Discussion

A 41-year-old male patient came with facial injuries after a motorcycle vehicle accident. Physical examination revealed skin loss, nasolabial penetrating wound with irregular border which measured 3×2 cm, abrasive wounds on the facial area and facial asymmetry. Skull AP- Lateral X-ray displayed no signs of skull fracture. The patient received wound debridement followed by V-Y advancement flap procedure under local anesthesia.

The V-Y advancement flap is a technique for soft tissue reconstruction such as cutaneous tissue defects and one of the options in reconstructing the facial area. The key to the success of this procedure is to maintain the underlying pedicle of the detached skin, thus maintaining the blood vessel supply. The v-y advancement flap has a design principle of placing the scar along relaxed skin tension lines (RSTLs/Langer's line) and allowing tension-free closure of the defect. The V-Y advancement flap (VYAF) procedure that

was performed on this patient aims to reconstruct the defective facial area by rehabilitating function, minimizing tension and maximizing aesthetics based on Langer's line reference.<sup>1,3</sup> This refers to study by Chang et al. which demonstrated that the V-Y advancement flap is an easy and safe method to reconstruct the face with low morbidity. They believe that with proper design placement and cautious dissection it can provide good aesthetic and functional results.<sup>[1]</sup>

Placement of the incision in the direction or parallel to Langer's line can achieve minimal scarring and lead to a more aesthetically favorable result.<sup>[10]</sup> Langer's line in the face often runs perpendicular to the underlying muscle, and in the neck area it usually appears to run perpendicular to the flexion area, in which case Langer's line runs horizontally on the forehead, as well as perpendicular to the vertical frontalis muscle. The ultimate goal of scar repair is to orient the scar parallel to Langer's line, so the placement of the incision in the

direction of Langer's line must first be decided prior to the administration of local anesthesia and the V-Y advancement flap procedure.[5]

An elliptical-shaped incision is made over the defect at a ratio of 3: 1, with the length of the ellipse is designed to be three times longer than the defect itself. The advancing edges of both flaps are refined and followed by subcutaneous dissection. Dissection is performed beneath each V-shaped flap to create a narrow vertical base of tissue at the center. Both island flaps are moved forward and brought together to cover the primary defect, which is placed within the boundaries of the aesthetic unit or in Langer's line. The secondary defects are subsequently closed using primary closure. Flaps designed on the lip or cheek can be advanced further compared to the forehead, due to the thicker layer of subcutaneous fat.[3,5,6]

The use of V-Y advancement flap technique in this case also has similar principles with the study performed by Sachdeva et al. on a patient with 4.2-cm invasive, well-differentiated squamous cell carcinoma with rapid growth and poorly defined borders in the left mid-temporal region that has been performed Mohs micrographic surgery and V-Y advancement flap. They concluded that the V-Y advancement flap can be used in a large mid-temporal defect while maintaining the aesthetic and functional elements of the patient. Sachdeva et al. explained that the V-Y advancement flap technique relies on maintaining flap viability through careful flap design, anatomical landmarks, dissection, and the vascular pedicle.[11]

Mokerjee et al. also demonstrated the combination of Tripier and V-Y advancement flap techniques to reconstruct large defects at the lid-cheek junction involving the lower eyelid. The results of Mokerjee et al. showed that the combination of Tripier and V-Y advancement flap techniques is very good

for reconstructing defects at the lid-cheek junction and in the future it is possible to be used in the reconstruction of large defects.[12]

Putri et al. in their study have chosen to use V-Y advancement flap in a patient with a blackened lesion on the left vermilion border of the upper lip with a diameter of 2 cm for three months, and suspected of basal cell carcinoma. This technique was chosen with consideration of functional and aesthetic outcomes. The results showed that the placement of V-Y flap in this case can resemble the original vermilion border and lip symmetry can be maintained, in addition to the use of nasolabial V-Y flap is also done to maintain the nasolabial fold and prevent facial distortion. Putri et al. concluded that reconstruction of small to medium-sized facial defects with V-Y advancement flap provides better aesthetic results with minimal scarring.[13]

These findings are in line with the results of a previous study performed by Flores et. Al who determined that V-Y advancement flaps can produce better scar appearance scores compared to bilobed flaps on highly sebaceous noses.[14]

Another study by Viciania et al. showed that the double-opposing V-Y advancement flap for nasal tip reconstruction is an excellent choice of method for reconstruction cases that require a high level of aesthetics such as limited defects in the nasal tip, compared to other methods such as bilobed flaps. The results show that there is no distortion of the nasal tip with an unnoticeable scar.[15]

In order to provide maximum results after the V-Y advancement flap technique in this case, the patient was instructed to perform management and wound care therapy at home including routine irrigation with antibacterial agent wound irrigation and NaCl solution, and applied wound gel. Wound care therapy at home was chosen to accelerate the postoperative rehabilitation and healing process, especially to prevent infection and the risk of wound dehiscence,

and improve patient comfort, this is in accordance with the recommendations of The European Wound Management [8,16,17]

The physiological wound healing process has a very complex and dynamic response to get a favorable result, so that the implementation of wound care therapy requires an appropriate response to produce a sustainable anatomical recovery. This process involves hemostasis, migration of neutrophils, macrophages, fibroblasts and keratinocytes, and involves several phases: inflammation, proliferation and tissue remodeling. [16,18,19]

Wound cleansing is essential because it eliminates debris such as exudate or devitalized tissue that disrupts the wound healing process. Wound cleansing attempts in this case using the irrigation method with antibacterial agent wound irrigation and NaCl solution should be done to avoid trauma to the wound such as dehiscence and keep the wound healing environment infection-free.[9]

The results of a study by Riza and Bukit showed that irrigation with NaCl solution can reduce the level of pain, discomfort, trismus and swelling compared to other irrigation solutions in post surgical patients. NaCl solution can increase wound healing by affecting cell migration.<sup>20</sup> This finding is in line with a study by Powell which explained that the single use of commercially available antiseptic irrigation solutions for a short duration appears safe to be used on wounds to prevent surgical site infection.[21]

Wound cleansing was also followed by wound gel dressing to keep the wound healing environment moist, act as a barrier against fluid and bacterial contamination, prevent biofilm formation and accelerate the wound healing process.<sup>9</sup> A wound healing environment with balanced moisture can trigger cell growth and collagen proliferation in a healthy non-cellular matrix.[22]

Alberts et al. stated that the application of wound dressings with various materials such as hydrogels, foams, and antimicrobial dressings can improve wound healing, reduce the risk of infection, and provide comfort and reassurance to patients.[23]

Moradifar et al. explained that currently there are many kinds of wound dressings that can be applied for advanced wound care with functions to promote healing, reduce the risk of infection, and are multifunctional such as hemostatic, antimicrobial, and controlled drug release. Telemonitoring wound care therapy at home can also reduce the cost of treatment and visits to the clinic, as well as optimize wound care and patient recovery outcomes.[24]

## Conclusion

This case report highlights that the combination of V-Y advancement flap procedure and wound care therapy for maxillofacial trauma can lead to excellent outcomes. The use of V-Y advancement flap technique with Langer's line reference in this case can minimize tension and maximize aesthetic outcomes. Wound care therapy at home with routine irrigation solutions and gel to prevent biofilm, can be a favorable combination after surgical treatment.

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## Conflict of Interest

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## References

1. Chang DH, Lu Y Di, Lin TW, Chang KC. Versatile Use of V-Y Advancement Flap for Facial Defect Reconstruction: A Case Series in Asian Patients. *Aesthetic Plast Surg.* 2024;48(9):1663–71.
2. Kim RS, Yi C, Kim HS, Jeong HY, Bae YC. Reconstruction of large facial defects using a combination of forehead flap and other procedures. *Arch Craniofacial Surg.* 2022;23(1):17–22.
3. Schopper H, Kriet JD, Humphrey C. Advancement flaps. *Plast Aesthetic Res.* 2022;9(9).
4. Ilankovan V, Ethunandan M, Seah TE. Local Flaps in facial reconstruction: A defect based approach. *Local Flaps in Facial Reconstruction: A Defect Based Approach.* 2015. 1–356 p.
5. Fonseca RJ, Walker R V, Barber DH, Powers MP, Frost DE. *Oral & Maxillofacial Trauma.* 4th ed. St. Louis, Missouri: Elsevier Saunders; 2013.
6. Fernandes R. Local and Regional Flaps in Head & Neck Reconstruction: A Practical Approach. *Local and Regional Flaps in Head & Neck Reconstruction: A Practical Approach.* 2014. 1–248 p.
7. Crisci A, Crisci M. Rethinking a Reconstructive Technique : A Modified V-Y Flap Suture Technique with Horizontal Branch. *Presentation of a Clinical Case. J Clin Med Surg.* 2022;2(2):1055.
8. Tchuenkam LW, Titchou F, Mbonda A, Kamto T, Nwaha AM, Kamla IJ, et al. The gluteus maximus V-Y advancement flap for reconstruction of extensive soft tissue loss following an advanced sacral pressure ulcer. A case report and mini review. *Int J Surg Case Rep.* 2020;73:15–21.
9. Nimbalkar SS, Malani MR. An Updated Guidelines on Post-Operative Wound Management. *Int J Med Biomed Stud.* 2021;5(11):1–6.
10. Lemperle G. Prevention of hyper- and hypotrophic scars through surgical incisions in the direction of the “main folding lines” of the skin. *Plast Aesthetic Res.* 2020;7.
11. Sachdeva SS, Yousefian F, Vasile G, Hammel JA. V-Y Advancement Flap in Mid- Temporal Defect Reconstruction After Mohs Surgery. *Am J Case Reports .* 2025;26:1–4.
12. Mookerjee VG, Prassinis AJ, Alper DP, Clune JE. Combined Tripiere and V-Y Advancement Flaps for Reconstruction of Large Lid-cheek Junction Defects. *Plast Reconstr Surg - Glob Open.* 2023;11(3):E4874.
13. Putri SA, Fitra YJ, Kurniadi. V-Y Nasolabial Flap for Reconstruction After Basal Cell Carcinoma Excision. *Cermin Dunia Kedokt.* 2022;49(6):348–50.
14. Flores K, Degesys CA, Kearney E, Retterbush P, Merritt BG. Nasalis-Based V to Y Flap Versus the Bilobed Flap. *Dermatologic Surg [Internet].* 2021 May 1 [cited 2025 May 28];47(5):618–22.
15. Viciano EJ, Lessard AS. V-Y Flap for Nasal Reconstruction. *Plast Reconstr Surg – Glob Open.* 2020;1–6.
16. Khaerotib, Peristiowati Y, Wardani R. Modern Wound Care Application: A Literature Review. *Int J Sci Soc.* 2021;3(1):280–92.
17. Yao Huang, Jiale Hu, Ting Xie, Zhaoqi Jiang, Wenjing Ding, Beiqian Mao LH. Effects of home-based chronic wound care training for patients and caregivers. *IWJ Wiley.* 2023;20:3802–20.
18. Sanchez-Puigdollers A, Toll A, Morgado-Carrasco D. Postoperative Wound Care in Dermatologic Surgery: Update And Narrative Review. *Actas*

- Dermosifiliogr [Internet].2024;115(10):T957–66.
19. Wang X, Tan J, Ni S, Zhou D, Liu B, Fu Q. Antimicrobial efficacy of composite irrigation solution against dominant pathogens in seawater immersion wound and in vivo wound healing assessment. *Front Microbiol.* 2023;14(May):1–10.
  20. Riza A, Bukit GAK. Comparison of effectiveness of normal saline, aquades and mineral water as an irrigation solution in odontectomy of impacted mandibular third molar in University of Sumatera Utara Hospital. *J Dentomaxillofacial Sci.* 2022;7(2):121–4.
  21. Powell D, Comer B, Wu B, Dietz P, Bou-Akl T, Ren W ping, et al. Effect of Commercially Available Wound Irrigation Solutions on Uninfected Host Tissue in a Murine Model. *Arthroplast Today* [Internet]. 2024;25:101300.
  22. Hastuti H, Nugraha BA, Annisa HN, Aprilia I, Maesaroh I, Karwati K, et al. The effectiveness of hydrocolloid dressing in post-operative wound healing: a narrative review. *J Midwifery Nurs.* 2024;6(2):572–9.
  23. Alberts A, Tudorache DI, Niculescu AG, Grumezescu AM. Advancements in Wound Dressing Materials: Highlighting Recent Progress in Hydrogels, Foams, and Antimicrobial Dressings. *Gels.* 2025;11(2):1–36.
  24. Moradifar F, Sepahdoost N, Tavakoli P, Mirzapoor A. Multi-functional dressings for recovery and screenable treatment of wounds: A review. *Heliyon* [Internet]. 2025;11(1):e41465.