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Assessment of Early Pain Management in Fracture Cases in the Emergency Department: Evidence from Clinical Practice

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Abstract: Open fractures are serious injuries in which bone fragments are directly exposed to the external environment, resulting in a significantly higher risk of infection compared to closed fractures. Patients presenting with fractures to the emergency department (ED) are initially assessed using the airway, breathing, circulation, disability, and exposure (ABCDE) approach. This serves as one of the strategies to reduce the pain experienced by patients with fractures. This study employed a descriptive approach with a descriptive case study method, aiming to provide an overview of the initial management of a patient with an open fracture of the right tibia. General initial management of pain included immobilization techniques, hemorrhage control, and the administration of analgesics, which were found to reduce pain levels and prevent further complications. The study concludes that general initial management is an essential and effective approach in the early treatment of open fracture patients. This process not only focuses on medical aspects but also addresses the holistic nursing needs of patients. Further research is recommended to evaluate the long-term effectiveness of general initial management.

Keywords: Fracture, Initial Management, Emergency Department

INTRODUCTION

One of the most common types of trauma with a high incidence of accidents is fracture. The prevalence of cruris fractures worldwide has continued to increase annually. In 2019, there were 178 million fracture cases globally, and according to World Health Organization data, the global prevalence has risen to 440 million, representing a 70.1% increase since 1990 (1). The most frequently affected anatomical sites include fractures of the patella, tibia or fibula, and ankle (2). It is estimated that approximately 1.7 million people sustain fractures each year, occurring more often in older adults and with a higher risk among women compared to men (3).

In Indonesia, the prevalence of fracture cases has reached 5.8%, with the highest prevalence found in lower extremity fractures caused by accidents, accounting for 63,082 of 92,976 total cases. Among these, there were 14,027 cases of cruris fractures. The incidence of open long bone fractures is reported at 13 cases per 100,000 people annually (4). Segmental tibial fractures, however, are relatively rare, accounting for only 3–12% of all tibial shaft fractures (5). Compared with data from the Basic Health Research (Riskesdas), the prevalence of fractures in Indonesia has shown a slight decrease of 2.7% (6).

The incidence of fractures in South Sulawesi is relatively higher than the national average. The national prevalence of injuries is 8.2%, but the highest rate was reported in South Sulawesi at 12.8%, according to the 2013 Riskesdas (7). In this province, motorcycle accidents (43.6%) and other land transportation accidents (6.8%) were the leading causes of injuries, including fractures (7).The management of open fracture patients in the emergency department (ED) presents unique challenges for healthcare providers, particularly nurses, as patients often arrive with severe pain, active bleeding, and a high risk of hypovolemic shock and infection (8). Initial management in the ED is a critical phase for ensuring patient safety, especially in efforts to control pain, stop bleeding, perform immobilization, and

prepare patients for definitive medical treatment. The "golden period" principle emphasizes that interventions within the first 6–7 hours after trauma are crucial in determining recovery outcomes (9).One approach used in the early trauma management phase is general initial management, which encompasses primary assessment using the ABCDE (Airway, Breathing, Circulation, Disability, Exposure) framework, hemorrhage control, administration of analgesics, and immobilization. If fractures are not managed promptly and appropriately, serious complications may arise, such as infection, neurovascular injury, compartment syndrome, and malunion or nonunion of the bone (10). These complications can lead to permanent disability, chronic pain, and impaired mobility (11).

This intervention aims not only to prevent mortality and complications but also to reduce pain rapidly and effectively. Techniques such as splint application, pressure bandaging, and intravenous analgesic administration are integral practices that must be implemented in a timely and standardized manner (12). However, in practice, this approach is often emphasized from the medical perspective, while the critical role of nurses in implementing initial interventions in the ED is underrepresented.To date, there have been limited reports or scientific studies highlighting the specific nursing role in applying general initial pain management in open fracture cases, particularly in the emergency department (13). Most existing research focuses on operative and pharmacological measures, while systematic and holistic early nursing interventions are rarely discussed, especially in regional hospitals such as Makassar City Hospital (14). Unfortunately, many studies emphasize only medical aspects such as bone fixation and infection control, whereas early nursing interventions in pain management for open fracture patients in the ED are still rarely reported systematically (15).This study aims to provide an overview of the initial management of a patient with an open fracture of the right tibia. Specifically, it seeks to present empirical insights into the effectiveness of emergency nursing interventions in controlling bleeding, alleviating discomfort, and preventing further complications. Moreover, this research is expected to strengthen the scientific basis for emergency nursing practice so that its findings can serve as a reference to improve the quality of care, accelerate treatment processes, and support patient safety efforts in emergency departments and pre-hospital settings.

CASES

On March 21, 2025, at 10:30 WITA, a 47-year-old male patient, initials Mr. "S," was brought to the Emergency Department (ED) of Makassar City Hospital by his family. The patient complained of pain in his right leg and presented with an open wound on the right lower extremity following an accident. The patient was categorized as *yellow triage*.Primary survey findings: The airway was patent with no abnormalities. Breathing assessment revealed a respiratory rate of 24 breaths/minute, SpO_2 98%, and no use of respiratory aids. Circulation assessment showed blood pressure of 120/80 mmHg, capillary refill time (CRT) <2 seconds, and a pulse rate of 83 beats/minute. Disability assessment indicated difficulty moving the right lower extremity, with a consciousness level of *compos mentis* (GCS 15: E4 V5 M6). Exposure examination revealed an open wound on the right ankle, measuring 6 × 5 cm in area and 1 cm in depth.Secondary survey findings: The patient had no history of allergies or previous illnesses. Examination of the extremities revealed an open wound measuring 6 × 5 cm. Muscle strength in the upper extremities was 5/5 bilaterally, and in the lower extremities: left 5/5, right 4/5 with limited range of motion (ROM) in dorsiflexion and plantar flexion. Back and spinal examinations showed no abnormalities. Psychosocial and sexual assessments revealed no issues.Diagnostic investigations: Radiological examination (pedis/ankle dextra AP/LAT) revealed distal fibular fracture and distal tibial fracture of the right leg, accompanied by posterolateral dislocation of the ankle joint. Other bones appeared intact, with noted soft-tissue swelling in the right ankle and foot. Impression: fracture of the right tibia and fibula. Laboratory results (March 21,

2025) showed abnormalities, including elevated leukocytes (23.6 $\times 10^9$/L), thrombocytosis (447 $\times 10^9$/L), low platelet distribution width (PDW 8.1), low mean platelet volume (MPV 8.5), elevated neutrophils (83.6%), and decreased lymphocytes (9.5%).Therapy administered**:** The patient received intravenous fluids (Ringer Lactate, 20 drops/min, macro set), ranitidine 50 mg IV every 12 hours, ketorolac 10 mg IV every 12 hours, and topical Cavida gel applied to the wound.

METHODS

This study employed a descriptive approach with a descriptive case study design, aiming to provide an overview of the initial management of a patient with an open fracture of the right tibia. The general characteristics of the respondent included a 47-year-old male patient. The study was conducted in the Emergency Department (ED) of Makassar City Hospital on March 21, 2025.The subject presented with complaints of pain in the area of an open wound on the lower right leg. The initial pain score, measured using the Numeric Rating Scale (NRS), was 6, indicating moderate pain. Prior to intervention, the patient was provided with an explanation regarding the procedures and therapeutic benefits, and verbal informed consent was obtained. Patient identity and confidentiality were protected in accordance with nursing ethical principles.

RESULT AND DISCUSSION

Result

The assessment conducted at Makassar City Hospital revealed that the initial management of the patient with an open fracture upon arrival at the Emergency Department (ED) included immediate wound care and bleeding control. The first step taken was to receive the patient, who was brought in by his family, and position him in the ED treatment area. The wound was then cleaned, and bleeding was controlled using sterile gauze roll dressings as a tertiary dressing.

Table 1. Pre–Post Nursing Intervention in Wound Care Management

Implementation	Time	Pre Evaluation	Time	Post Evaluation
Bleeding control using sterile gauze	10.40	DS : - DO : Bleeding was observed, requiring 10 gauze pads	10.50	DS : - DO : The bleeding was reduced.
Monitoring wound characteristics	10.45	DO : the wound measured 6 × 5 cm and appeared contaminated	10.55	DO : The wound appeared clean, but remained open
Wound cleansing with normal saline solution (NaCl).	10.50	DO: A wound was observed on the patient's right leg, and it appeared contaminated	11.00	DO : The wound appeared clean.

A pressure dressing was applied using sterile gauze without exerting excessive pressure.	11.05	DS : The patient reported pain in the right leg DO : The patient appeared grimacing, with a pain score of 5.	11.15	DS : The patient reported reduced pain in the right legDO : The patient was still grimacing, with a pain score of 4

Table 2. Pre–Post Nursing Interventions in Pain Management

Implementation	Time	Pre Evaluation	Time	Post Evaluation
dentifying the pain scale	10.35	DS : The patient complained of pain in the right leg, with a pain score of 6." DO : The patient appeared grimacing	10.40	DS : Pasien mengatakan nyeri berkurang menjadi skala 5 DO : pasien masih tampak meringis
Identifying factors that aggravate and relieve pain	10.40	DS : The patient reported pain when the leg was moved and felt comfortable when the leg remained still. DO : The patient appeared not to move his leg	10.45	After immobilization, the patient felt comfortable.
Teaching non-pharmacological therapy (deep breathing relaxation techniques).	11.15	DS : pasien mampu melakukan terapi relaksasi napas dalam	11.25	DS : The patient felt comfortable DO : The patient was observed to be relaxed

Discussion

Public knowledge regarding the management of emergency victims is generally still limited. Communities need education on how to handle emergency situations before receiving definitive medical care. Improper management may worsen the victim's condition. Emergency assistance must not be performed carelessly; there are specific steps and stages that a responder should follow. Many laypeople are often confused about how to provide proper first aid to accident victims. The most common action taken is transporting the victim directly to the hospital without considering the appropriate method of evacuation (16).The findings of this study indicate that general initial pain management was effective in reducing pain levels and improving comfort in patients with open tibia-fibula fractures. Pain management included the use of pressure dressings and non-pharmacological techniques. A pressure dressing involves various measures to stop bleeding in injured areas using appropriate instruments. In addition to controlling hemorrhage, this intervention helps prevent hypovolemic shock. Pressure dressings are also used to reduce and relieve pain, as the technique allows bleeding control and pain reduction without exerting excessive pressure on the wound, using sterile gauze and other materials (17).

This study is consistent with research conducted by Adolph (2021), which examined the effectiveness of pressure dressings in wound patients. The study demonstrated that pressure dressings applied by three medical personnel were safe and useful in controlling external bleeding in hospital cases, while also reducing pain. Another study also reported that the use of sterile pressure dressings is generally effective in stopping bleeding (19). Research entitled *The Effectiveness of Simple Interrupted Suture Technique in the Closure of Laceration Wounds (Vulnus Laceratum) in Post-Traffic Accident Patients at the Emergency Department of Prof. Dr. Margono Soekarno Hospital* showed that the simple interrupted suture technique, which involves single-stitch wound closure, proved effective in stopping bleeding and accelerating wound healing (20).Similarly, the study by Munirah et al. (2024) reported that fracture management with immobilization in plaster casts during observation requires monitoring of infection indicators such as wound color, size, and odor, as well as the presence of swelling, redness, or pus at the site. After the cast and dressing were permanently removed, the wound was cleaned with normal saline (NaCl), and pain levels were assessed (22).

In line with wound care practices for addressing impaired skin integrity, nurses apply multiple interventions. These involve gradually removing plaster and bandages, followed by wound cleansing with NaCl. The management of skin integrity aims to support healing, with close monitoring of infection indicators including wound color, odor, pain location, swelling, redness, and intensity. Such wound care practices have been shown to enhance granulation tissue formation, thereby accelerating the healing process (23).

Several studies have emphasized that early mobilization is critical in improving blood circulation, preventing postoperative complications, and accelerating patient recovery. This includes exercise, physical activity to meet basic needs, and engagement in family, group, and community activities. Achieving these outcomes requires adequate systemic function without significant psychological or physical limitations. Patients with fractures need early mobilization due to the discontinuity of bone tissue, which is typically characterized by pain, crepitus, and impaired mobility (24).Following the application of exposure management, there was a reduction in extremity movement, decreased range of motion, reduced pain, and diminished physical weakness, while ensuring patient comfort. Physical mobility impairment, which limits the ability of upper and lower extremities to move independently, is consistent with findings from previous studies (25). Characteristic limitations include slow movement, restricted joint range of motion, difficulty changing positions, and the need for assistance in performing other tasks. Postoperative improvement in quality of life requires appropriate patient education. Early mobilization is essential for enhancing circulation, preventing postoperative complications, and accelerating recovery, as supported by multiple studies (26).

CONCLUSION

General initial pain management was effective in the early treatment of patients with open fractures of the right tibia. Prompt and appropriate nursing interventions can reduce pain, maintain hemodynamic stability, and prevent complications. Nurses play a crucial role in implementing this management holistically and professionally. Emergency department nurses need to strengthen their competencies in acute pain management based on the ABCDE approach. Hospitals are encouraged to develop specific standard operating procedures (SOPs) for nursing-based management of open fractures. Further research is recommended to evaluate the long-term effectiveness of general initial management.

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REFERENCES

1. World Health Organization. Fracture. Geneva: WHO; 2022.
2. Wu AM, Bisignano C, James SL, Abady GG, Abedi A, Abu-Gharbieh E, et al. Global, regional, and national burden of bone fractures in 204 countries and territories, 1990–2019: a systematic analysis from the Global Burden of Disease Study 2019. Lancet Healthy Longev. 2021;2(9):e580–92.
3. Sigalingging. Karakteristik penderita fraktur kecelakaan lalu lintas. Palaeobulgarica. 2024;48(2):17–34.
4. Karcioglu O, Topacoglu H. Trauma surgery. In: Karcioglu O, Topacoglu H, editors. Istanbul: IntechOpen; 2018. p. 54–71.
5. Noviyani PS. SENTRI: Jurnal Riset Ilmiah. SENTRI J Ris Ilm. 2023;2(4):1275–89.
6. Badan Penelitian dan Pengembangan Kesehatan. Laporan Riset Kesehatan Dasar (Riskesdas). Jakarta: Kementerian Kesehatan RI; 2018.
7. Badan Pusat Statistik. Jumlah kecelakaan, korban mati, luka berat, luka ringan, dan kerugian materi yang diderita [Internet]. 2018 [cited 2025 Mar 22]. Available from: https://www.bps.go.id/linkTableDinamis/view/id/1134
8. Guryel E, McEwan J, Qureshi AA, Robertson A, Ahluwalia R, Baxter M, et al. Consensus on managing open ankle fractures in the frail patient: understanding the pathology, clinical outcomes, and common problems utilizing a modified Delphi process. Bone Joint Open. 2024;5(3):236–42.
9. Okada K, Matsumoto H, Saito N, Yagi T, Lee M. Revision of "golden hour" for hemodynamically unstable trauma patients: an analysis of a nationwide hospital-based registry in Japan. Trauma Surg Acute Care Open. 2020;5(1):1–5.
10. Aquilina AL, Claireaux H, Aquilina CO, Tutton E, Fitzpatrick R, Costa ML, et al. Development of a core outcome set for open lower limb fracture: what core outcomes should be measured? Bone Joint Res. 2023;12(4):294–305.
11. Permatasari C, Sari IY. Terapi relaksasi Benson untuk menurunkan rasa nyeri pada pasien fraktur femur sinistra: studi kasus. J Keperawatan Merdeka. 2020;2(2):216–20.
12. Kawanishi K, Fukuda D, Miyashita T, Kitagawa T, Niwa H, Okuno T, et al. Effects of compression intervention on the thigh using elastic bandage on lateral femoral pain after trochanteric fractures: a multicenter randomized controlled trial. Gerontol Geriatr Med. 2023;9:1–8.
13. Pulungan N, Thoriq YM, Hartono FG, Adnan ML, Sasetyo DR. Characteristic and management of neck trochanteric femur fracture at a tertiary hospital in Indonesia: a retrospective, single-center study. J Orthop Traumatol Surabaya. 2024;13(2):61–8.
14. Unadkat A, Stoller E, Pine H, Eisner ZJ, Klapow MC, Kulkarni AJ, et al. Prehospital extremity fracture management in low- and middle-income countries: a scoping review of lay first responders and traditional bonesetters. World J Surg. 2025;49(7):2255–63.
15. Whiting PS, Obremskey W, Johal H, Shearer D, Volgas D, Balogh ZJ. Open fractures: evidence-based best practices. OTA Int. 2024;7(3):1–5.
16. Ferianto K. Edukasi dan simulasi bantuan kegawatdaruratan balut bidai, evakuasi dan transportasi pada kasus cedera bagi PMR SMAN 1 Merakurak. ABDIMASNU J Pengabdi Kpd Masy. 2023;3(1):5–10.

17. Jamal F, Andika TD, Adhiany E. Penilaian dan modalitas tatalaksana nyeri. Jurnal Kesehatan. 2022;5(3):66–73.
18. Adolph R. Penerapan balut tekan terhadap penurunan risiko perdarahan pada pasien dengan vulnus laceratum di ruang IGD RSUP Dr Tadjuddin Chalid Makassar. 2021;1–23.
19. Parahita SP, Kurniyanta P. Management of extremity fracture in emergency. Denpasar: Rumah Sakit Pusat Universitas Udayana; 2010. p. 1–18.
20. Ismawati, Djalil RH, Kasim Z. Pengaruh edukasi teknik balut tekan terhadap penghentian perdarahan pada masyarakat awam di Kecamatan Tuminting, Kota Manado. J Anestesi. 2023;1(1):75–82.
21. Munirah F, Amalia R, Kamal A. Asuhan keperawatan pada pasien close fracture neck femur sinistra: studi kasus. J Penelit Kesehat Suara Forikes. 2020;6(4):1333–6.
22. Andri J, Febriawati H, Padila, Harsismanto. Nyeri pada pasien post op fraktur ekstremitas bawah dengan pelaksanaan mobilisasi dan ambulasi dini. Jurnal Penelitian Kesehatan. 2020;2(1):61–70.
23. Universitas Muhammadiyah Jember. Pengaruh pendidikan dasar gawat darurat balut bidai terhadap kemampuan menolong korban fraktur pada anggota KSR di Universitas Muhammadiyah Jember. Jurnal Pengabdian Masyarakat. 2021;3(2):32–8.
24. Susanti DC, Suryani R. Pengaruh mobilisasi dini terhadap skala nyeri pada pasien post operasi fraktur femur di ruang Kenanga RSUD Sunan Kalijaga Demak. Jurnal Keperawatan. 2020;5(1):15–23.
25. Ningsih R. Dukungan mobilisasi fisik pada pasien fraktur dengan masalah gangguan mobilitas fisik di Poltekkes Kemenkes Palembang. J Poltekkes Palembang. 2022;2(2):132–8.
26. Anjasmara AC. Dukungan mobilisasi fisik pada pasien fraktur dengan gangguan mobilitas fisik di ruang Melati 4 RSUD Dr Soekardjo Kota Tasikmalaya. Jurnal Kesehatan. 2024;5(3):115–21.