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CHARACTERISTICS OF DELAYED SECONDARY MANAGEMENT OF GUNSHOT AND SHRAPNEL WOUNDS OF THE FACE AND NECK WITH EXTENSIVE TISSUE DEFECTS

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Summary.

Combat-related maxillofacial injuries frequently involve extensive soft tissue loss, contamination, and complex anatomical disruption. Gunshot and shrapnel wounds of the face and neck often present with large defects communicating with the oral cavity, accompanied by fractures of the facial bones. Delayed secondary surgical wound management in such cases presents considerable technical challenges. Modified button suture techniques may offer significant advantages for the approximation of wound edges subjected to high tension.

Objective. *To evaluate the efficacy of a modified button suture technique for delayed secondary closure of extensive facial and cervical soft tissue defect in a patient with combat-related gunshot trauma.*

Materials and Methods. *A clinical case is presented of a 42-year-old male patient with a through-and-through gunshot-shrapnel injury of the left buccal, submandibular, and cervical regions, combined with a comminuted fracture of the mandibular angle. Secondary surgical wound management was performed on post-injury day 11. Polyamide sutures (3/0) were passed through dense, fibrotic tissues using large-gauge injection needles; external fixation was achieved with 2-3 cm plastic buttons to ensure even tension distribution. The study was conducted in accordance with the ethical principles set forth in the Declaration of Helsinki, as approved by the Bioethics Commission of the M. I. Pirogov National Medical University. Written informed consent for the publication of clinical data was obtained from the patient, with confidentiality of personal information guaranteed.*

Results. *The modified button suture technique enabled effective approximation of wound edges without excessive tension, preventing suture cut-through. Healing proceeded by primary intention without complications. Intermaxillary fixation was discontinued at 6 weeks, with restoration of occlusion and con solidation of mandibular fragments. At 6 weeks, a dense but functionally insignificant scar was observed.*

Conclusions. *The modified button suture technique represents a reliable and efficacious option for delayed secondary closure of extensive soft tissue defects of the face and neck following gunshot injuries, ensuring uniform tension distribution, minimising the risk of wound dehiscence, and promoting primary wound healing. This technique is applicable to both military and civilian maxillofacial surgical practice.*

Keywords: *Gunshot Wounds; Button Sutures; Regeneration; Tissue Defect; Secondary Surgical Wound Debridement; Maxillofacial Region.*

Introduction

Modern combat-related facial trauma is diverse in nature and, encompassing both ballistic and non-ballistic injuries caused by various types of weaponry. The widespread use of rocket and artillery systems has established blast wounds as a distinct category of combat surgical trauma, characterised by combined injury mechanisms. When the primary or sole component of a blast injury is shrapnel-related trauma, however, such cases are more appropriately categorised as gunshot-shrapnel wounds [1].

Gunshot and shrapnel wounds have a distinct clinical profile, as they are frequently accompanied by extensive tissue defects and contamination [1-4]. The selection of an optimal treatment strategy for such injuries remains challenging, as no standardised clinical approach has been established [7,8]. One of the most significant challenges involves delayed secondary debridement of wounds with extensive soft and hard tissue defects in the facial region, with such patients typically presenting to rear-area hospitals with purulent, deformed wounds and gaping, unhealed defects that frequently communicate with the oral cavity. In these cases, wound edge approximation is necessary but is often complicated by excessive tension, which increases the risk of suture dehiscence.

In the delayed surgical management of wounds with tissue loss, button sutures represent an effective method for wound edge approximation that minimizes the risk of suture failure.

The first successful widespread use of button sutures for both fresh and granulating facial gunshot wounds was reported during military operations in 1939-1940. The application of early plastic reconstruction techniques employing these sutures resulted in recovery in up to 96% of patients with facial soft tissue injuries across the front lines.

Subsequent improvements in wound closure techniques are described in the literature [1-25]. A simplified method for applying button sutures to the facial region was developed, and in 1943, the purse-string button suture technique was introduced. This advancement facilitated the reduction and, in some cases, complete closure of circular wounds – for example, in cases of chin avulsion and similar injuries.

The button suture technique, while relatively simple, requires refinement in certain cases involving complex facial and cervical defects.

In wartime medicine, tension-relieving techniques such as modified button sutures may offer considerable advantages for the closure of large soft tissue defects in various anatomical regions, including those encountered in female patients. Their primary application in the present study pertains to maxillofacial injuries; however, the principles of controlled tension distribution and low-cost stabilization are potentially applicable to other

high-risk wound types, as discussed in the following sections [26-29].

Objective

To describe the clinical management and outcomes of an extensive facial and cervical soft tissue defect in a patient with combat-related gunshot trauma treated with a modified button suture technique.

Materials and Methods

This study presents a clinical case of delayed secondary surgical wound management in a patient with an extensive gunshot-induced defect of the face and neck, treated at the Department of Maxillofacial Surgery of the Vinnytsia Regional Pirogov Memorial Clinical Hospital. A modified button suture technique was developed and employed. Given the extensive area of tissue loss and the need for wound edge approximation under significant tension, standard needle ligature techniques were not feasible. Large-gauge injection needles were used as guides, with nylon (polyamide) sutures (3/0) threaded through the beveled opening and passed through the tissue via the needle channel. Standard metallic suture plates being unavailable, conventional buttons (2-3 cm in diameter, with 2-4 holes) were used for external suture fixation. This technique enabled effective approximation of wound margins, reduced tissue tension, and contributed to improved wound healing and aesthetic outcomes.

The study was conducted in accordance with the ethical principles set forth in the Declaration of Helsinki, as approved by the Bioethics Commission of the M. I. Pirogov National Medical University. Written informed consent for the publication of clinical data was obtained from the patient, with confidentiality of personal information guaranteed.

Results and discussion

A patient with an extensive facial and cervical defect was treated in the late post-injury period, 11 days after the injury. Patient R., a 42-year-old male, was admitted to the Department of Maxillofacial Surgery of the Vinnytsia Regional Pirogov Memorial Clinical Hospital with the following diagnosis: blast-shrapnel trauma; through-and-through gunshot wound of the left buccal and submandibular regions and the lateral surface of the upper and middle thirds of the neck on the left, accompanied by an extensive soft tissue defect communicating with the oral cavity; comminuted fracture of the left mandibular angle.

The patient was transferred to the maxillofacial surgery department 7 days after the injury. At the initial stage of treatment, primary surgical wound debridement, hemostasis, and dressing application were performed, along with antibiotic therapy. Mandibular fixation and wound closure were not performed.

On clinical examination, notable facial asymmetry secondary to swelling of the left hemiface was observed, along with malocclusion and an extensive wound in the left submandibular and cervical regions. The wound measured approximately 10 × 17 cm, extended deeply to the cervical neurovascular bundle, and exhibited significant soft tissue loss with retracted edges; it was gaping and communicated with the oral cavity in the retromolar region (Figure 1). The wound surface was contaminated and covered with fibrinopurulent exudate, with a fetid odour and dense, contracted margins.

Figure 1. Patient R., 42 years old. Diagnosis: blast-shrapnel injury; through-and-through gunshot wound with infection of the left buccal and submandibular regions and the lateral surface of the neck on the left, with a soft tissue defect communicating with the oral cavity; comminuted fracture of the left mandibular angle.

The mandible was displaced toward the left, in the direction of the defect, with salivary leakage into the wound and consistent saturation of the dressings with saliva. Crossbite was present, and a bony defect was palpable in the region of the left mandibular angle. Orthopantomography and computed tomography (CT) demonstrated a comminuted fracture of the mandibular angle, body, and ramus on the left, with loss of bone continuity.

On the day of admission, intermaxillary fixation was performed using a bimaxillary arch bar with eyelet hooks and elastic traction under local anaesthesia, with restoration of occlusion. The mucosal defect in the left retromolar area was simultaneously sutured, thereby isolating the cervical wound from the oral cavity. Salivary leakage into the cervical wound ceased by postoperative day 4. The wound in the submandibular and cervical regions was managed conservatively for several days with Betadine®-impregnated dressings.

Delayed surgical wound management with local flap closure was performed under general anaesthesia on postoperative day 4 (day 11 post-injury), following confirmed complete wound bed decontamination.

A flap of the anterior cervical triangle was elevated to the level of the superficial lamina of the deep cervical fascia, incorporating the fascial sheath of the cervical neurovascular bundle and the sternocleidomastoid muscle. Stay sutures were applied to approximate the widely separated wound edges, and button sutures were placed to prevent suture cut-through in the soft tissues. Polyamide sutures were passed through the dense, fibrotic tissues using large-gauge injection needles (0.8 × 40 mm).

The wound edges were mobilised and approximated, with sutures tied over four buttons to ensure even tension distribution (Figure 2). Approximation of the retracted cervical flap edges enabled secondary wound closure without excessive tension. The surgical site was drained with tubular drains, which were used for irrigation during the early postoperative period.

The wound healed by primary intention without complications, with sutures removed gradually between postoperative days 10 and 14 (Figure 3).

Intermaxillary fixation was removed 6 weeks postoperatively, with fracture fragment consolidation observed and occlusion restored.

Following wound healing, a retracted, dense scar was observed, which did not result in functional impairment (Figure 4). An additional surgical procedure is planned to improve the aesthetic appearance of the postoperative area.

Delayed secondary surgical management of gunshot and shrapnel wounds presents specific challenges in cases involving deformed, retracted flaps of irregular shape with associated tissue defects. Increased curvature of the wound edge is associated with a proportionally greater tendency toward flap retraction, the extent of which is determined by the depth of involvement of the underlying structures, including the superficial and deep cervical fascia and muscles.

In delayed secondary wound management, such flaps require additional fixation of the entire tissue mass to enable tension-free skin closure. Button sutures facilitate layered closure of both the skin and subcutaneous tissues, thereby preventing wound dehiscence and frequently eliminating the need for additional reconstructive surgery.

Figure 2. Same patient following delayed secondary surgical wound management with local tissue flap reconstruction and button suture application.

Figure 3. Same patient on postoperative day 14 following suture removal.

Figure 4. Same patient 6 weeks postoperatively.

In modern military conflicts, extensive soft tissue defects subjected to high tension are encountered in the maxillofacial region, the trunk, the perineum, and the extremities. Tension-relieving and retention suturing techniques employing external bolsters or buttons on the suture loops distribute mechanical load over a broader skin surface, reduce local pressure on wound edges, and thereby decrease the risk of tissue cut-through and wound dehiscence. Clinical reports describe successful use of button or button-like bolsters for closure of decubitus ulcers, high-risk abdominal incisions, and other extensive soft tissue wounds, where they provided additional security during the early phase of healing and improved primary intention closure in compromised patients. Ordinary plastic buttons and similar devices can be sterilised and reused, which makes this technique particularly valuable in wartime settings with limited resources and mass casualties, where simple, inexpensive, and rapidly applicable methods are required for reliable closure of contaminated, high-tension wounds [26].

Historical gynaecological and urogynecological literature indicates that button sutures can be safely applied in female pelvic surgery. In the 19th century, Bozeman and other authors popularised the button suture for closure of vesicovaginal fistulas, achieving reliable approximation of friable vaginal tissues around the fistulous tract and demonstrating the feasibility of controlled tension distribution in this region [27,28]. More recent work has described the

use of single button sutures to join the walls of the cervical canal during procedures for complete occlusion of the cervical canal and external os, with the button serving as a simple external support to control suture tension [29]. Contemporary urogynecological protocols also describe single button sutures as one of the plication options in anterior colporrhaphy; however, a limited number of isolated button sutures may be insufficient for long-term support if used alone. These data suggest that modified button sutures may be considered a low-cost, rapidly deployable option for temporary or definitive closure of extensive perineal, vulvar, or lower abdominal soft tissue defects in female patients during wartime, particularly when complex flap reconstruction or specialised fixation devices are unavailable. Careful patient selection, protection of underlying hollow organs, and multidisciplinary collaboration with gynaecologists and urologists are essential, as high-quality comparative clinical data for these indications remain limited.

The application of button sutures significantly improves the quality of delayed surgical management of gunshot wounds and optimises wound healing through primary tension closure with local tissue advancement, without additional incisions.

Button sutures may be widely employed in the management of facial gunshot wounds, both as primary guiding and approximating sutures for flap wounds and for secondary closure of granulating wounds. Applied in this manner, button sutures enable effective full-depth approximation of wound edges, obviate the need for additional relaxing incisions in comparable clinical situations, and substantially reduce tissue tension along the primary suture line, thereby preventing suture cut-through and wound dehiscence.

Conclusions

1. Button sutures enable effective full-depth approximation of wound edges along the entire length of the defect and substantially reduce tissue tension along the primary suture line, thereby preventing suture cut-through and wound dehiscence.

2. Standard long injection needles may be used as guides for passing fixation sutures through dense wound margins, and conventional plastic buttons may be employed for external anchoring of the suture loops.

3. Button sutures may be widely adopted in the management of facial gunshot wounds, both as primary guiding and approximating sutures for flap injuries and as secondary closure sutures for granulating wounds.

Prospects for further research

Future research should focus on in-depth evaluation of the potential of modified button suture techniques in the management of extensive facial and cervical soft tissue defects resulting from gunshot and shrapnel injuries, with prospective clinical studies involving larger patient cohorts needed to assess the efficacy of this technique across different clinical scenarios and varying degrees of tissue loss.

Further investigation is required to optimise the selection of suture materials, fixation elements, and instruments for suture placement, as these factors may contribute to reducing tissue cut-through and improving wound healing outcomes. The development of individualised fixation devices using three-dimensional printing technology represents a promising direction, as it would enable more precise tension distribution along the wound margins based on individual anatomical features.

Long-term functional and aesthetic outcomes warrant comprehensive study, encompassing scar quality assessment, restoration of muscular function, and the potential to obviate extensive reconstructive procedures. Future studies should aim to establish standardised clinical protocols for delayed secondary closure of extensive soft tissue defects, which would improve the overall efficacy of treatment in both military and civilian maxillofacial surgery.

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Use of Artificial Intelligence

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References:

1. Zaruts'kyi YaL, Bilyi VIa, redaktory. Voienno-pol'ova khirurhiia: pidruchnyk [Military field surgery: textbook.]. Kyiv: Feniks; 2018. 544 s. (in Ukrainian)

2. Jeffery SL. The Management of Combat Wounds: The British Military Experience. Adv Wound Care (New Rochelle). 2016;5(10):464-73. DOI: http://doi.org/10.1089/wound.2015.0653 PMID: 27785380; PMCID: PMC5067872.

3. Peled M, Leiser Y, Emodi O, Krausz A. Treatment protocol for high velocity/high energy gunshot injuries to the face. Craniomaxillofac Trauma Reconstr. 2012;5(1):31-40. DOI: http://doi.org/10.1055/s-0031-1293518 PMID: 23449809; PMCID: PMC3348750.

4. Jeyaraj P, Chakranarayan A. Treatment Strategies in the Management of Maxillofacial Ballistic Injuries in Low-Intensity Conflict Scenarios. J Maxillofac Oral Surg. 2018;17(4):466-81. DOI: http://doi.org/10.1007/s12663-018-1089-0 PMID: 30344389; PMCID: PMC6181847.

5. Cho DY, Willborg BE, Lu GN. Management of Traumatic Soft Tissue Injuries of the Face. Semin Plast Surg. 2021;35(4):229-37. DOI: http://doi.org/10.1055/s-0041-1735814 PMID: 34819804; PMCID: PMC8604620.

6. Bezrodnyi BH, Dykuha SO, Kolosovych IV. Diagnosis and treatment of combat injuries of the heart and great vessels: Review. Med Nauka Ukr. 2020;16(2):69-74. DOI: http://doi.org/10.32345/2664-4738.2.2020.12

7. Buryanov O, Yarmolyuk Y, Los D, Vakulych M. Modern methods of surgical treatment of victims with limb gunshot injuries. Trauma. 2022;18(2):30-5. DOI: https://doi.org/10.22141/1608-1706.2.18.2017.102555

8. Moriscot A, Miyabara EH, Langeani B, Belli A, Egginton S, Bowen TS. Firearms-related skeletal muscle trauma: pathophysiology and novel approaches for regeneration. NPJ Regen Med. 2021;6(1):17. DOI: http://doi.org/10.1038/s41536-021-00127-1 PMID: 33772028; PMCID: PMC7997931.

9. Ivchenko DV, Varzhapetian SD, Mishchenko OM, Sydor OV, Petrenko YM, Yatsun YV, et al. Experience of the treatment of combat injuries of the maxillofacial area with titanium implants in the conditions of modern war. Pathologia. 2022;19(2):154-9. DOI: https://doi.org/10.14739/2310-1237.2022.2.260598

10. Sharma LCR, Jose MA. Gunshot injuries of the maxillofacial region. In: Bonanthaya K, Panneerselvam E, Manuel S, Kumar VV, Rai A, editors. Oral and maxillofacial surgery for the clinician. Singapore: Springer; 2021. p. 1241-59. DOI: http://doi.org/10.1007/978-981-15-1346-6_59

11. Powers DB, Delo RI. Maxillofacial Ballistic and Missile Injuries. In: Fonseca RJ, Barber HD, Powers MP, Frost DE, Walker RV, editors. Oral and maxillofacial trauma. 4th ed. Missouri: Elsevier Health Sciences; 2013. p. 696-716. DOI: https://doi.org/10.1016/B978-1-4557-0554-2.00027-7

12. Datarkar A, Tayal S. Management of soft tissue injuries in the maxillofacial region. In: Bonanthaya K, Panneerselvam E, Manuel S, Kumar VV, Rai A, editors. Oral and maxillofacial surgery for the clinician. Singapore: Springer; 2021. p. 1025-43. DOI: http://doi.org/10.1007/978-981-15-1346-6_49

13. Kademani D. Dental, oral, and maxillofacial emergencies. In: Lockhart PB, Patton LL, Glick M, Dubin PH, editors. Oral medicine and medically complex patients. 7th ed. Hoboken (NJ): Wiley-Blackwell; 2025. p. 115-42. DOI: http://doi.org/10.1002/9781119984382.ch5

14. Ioannidis CA, editor. Soft tissue injuries of the head and neck. 2nd ed. Cham: Springer; 2023. 450 p. DOI: http://doi.org/10.1007/978-3-031-14915-3

15. Singh V, Jain D, Kanna S. Soft Tissue Injuries. In: Singh AK, Sharma NK, editors. Maxillofacial Trauma: A Clinical Guide. Singapore: Springer Singapore; 2021. p. 145-57. DOI: https://doi.org/10.1007/978-981-33-6338-0

16. Kumar NG, Nair SG. Orbital and Maxillofacial Injuries. In: Waikar S. ed. Ocular Trauma in Armed Conflicts. Singapore: Springer; 2023. p. 151-79. DOI: https://doi.org/10.1007/978-981-19-4021-7

17. Terres J, Haggerty CJ. Maxillofacial Gunshot Wounds (GSW). In: Haggerty CJ, Laughlin RM, editors. Atlas of Operative Oral and Maxillofacial Surgery. 2022. p. 392-405. DOI: https://doi.org/10.1002/9781119683957.ch24

18. Yu J, Tidwell T, Schaefer AW, Lin K, Lee CC, Wang TH. Principles of care for patients with craniofacial ballistic injuries. Formos J Surg. 2023;56(2):33-42. DOI: http://doi.org/10.1097/FS9.0000000000000035

19. Miloro M, Ghali GE, Larsen PE, Waite PD, editors. Peterson's principles of oral and maxillofacial surgery. 4th ed. Cham: Springer; 2022. 2130 p. DOI: https://doi.org/10.1007/978-3-030-91920-7

20. Wall N, McCrum ML, Evans HL. Surgical Strategies in Trauma to the Head, Face, and Neck. In: Degiannis E, Doll D, Velmahos GC, editors. Penetrating Trauma: A Practical Guide on Operative Technique and Peri-Operative Management. Cham: Springer International Publishing; 2024. p. 249-58. DOI: https://doi.org/10.1007/978-3-031-47006-6_29

21. Wamkpah NS, Kimball A, Pipkorn P. Evidence-Based Medicine for Ballistic Maxillofacial Trauma. Facial Plast Surg. 2023;39(3):237-52. DOI: http://doi.org/10.1055/s-0043-1764347 PMID: 36929067.

22. Daniels JS, Albakry I, Braimah RO, Samara MI, Albalasi RA, Al-Rayshan SMA. Management of Maxillofacial Gunshot Injuries With Emphasis on Damage Control Surgery During the Yemen Civil War. Review of 173 Victims From a Level 1 Trauma Hospital in Najran, Kingdom of Saudi Arabia. Craniomaxillofac Trauma Reconstr. 2022;15(1):58-65. DOI: http://doi.org/10.1177/19433875211012211 PMID: 35265279; PMCID: PMC8899348.

23. Di Virgilio F, Camilletti P, Deneuche A. Management of devastating facial gunshot injuries in an English cocker spaniel. Australian Veterinary Practitioner. 2020;50(3):185-93. Available from: https://www.sciquest.org.nz/browse/publications/article/172371

24. Cheng B, Yang S, Fu X. Introduction to the repair and regeneration of war wound tissue. In: Fu X, editor. Regenerative Medicine in China. Singapore: Springer Singapore; 2021. p. 1-56. DOI: https://doi.org/10.1007/978-981-16-1182-7_1

25. Mohan VC, Gillipelli SR, Schmidt JL, Bovill JD, Latham KP. Mass Casualties, Shootings, and the Role of the Craniomaxillofacial Surgeon. Semin Plast Surg. 2025;39(1):14-8. DOI: http://doi.org/10.1055/s-0044-1801408 PMID: 40160833; PMCID: PMC11945211.

26. Adnot J, Salasche SJ, West RW. Button bolsters in dermatologic surgery. J Dermatol Surg Oncol. 1989;15(1):59-64. DOI: http://doi.org/10.1111/j.1524-4725.1989.tb03113.x PMID: 2642934.

27. Bozeman N. Case of Vesico-Vaginal Fistula, with Anteversion and Incarceration of the Cervix Uteri in the Bladder. Replacement of the Uterus, and Closure of the Fistulous Opening, by Means of the «Button Suture». Edinb Med J. 1858;4(4):330-6. PMID: 29646633; PMCID: PMC5309066.

28. Whitehead WMR. Successful operation for vesico-vaginal fistula, by the button suture, at the Hopital Necker, Paris. N Engl J Med. 1859;60(21):413-8. DOI: http://doi.org/10.1056/NEJM185906230602102

29. Cheung KW, Au TST, Li J, Seto MTY. First-trimester and early-second-trimester transvaginal cervical length before 16 weeks among women with preterm and term birth: a systematic review and meta-analysis. American Journal of Obstetrics & Gynecology MFM. 2024;6(5):101282. DOI: https://doi.org/10.1016/j.ajogmf.2024.101282

ОСОБЛИВОСТІ ПІЗНЬОЇ ВТОРИННОЇ ОБРОБКИ ВОГНЕПАЛЬНО-ОСКОЛКОВИХ РАН ОБЛИЧЧЯ ТА ШИЇ З ОБШИРНИМИ ДЕФЕКТАМИ ТКАНИН

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Резюме.

Бойові ураження щелепно-лицевої ділянки характеризуються значною травматичністю, великими дефектами тканин та високим ризиком інфікування. Вогнепальні й осколкові поранення обличчя та шиї часто призводять до складних дефектів, що сполучаються з порожниною рота та супроводжуються переломами кісткових структур. Відтермінована вторинна хірургічна

обробка таких ран є одним із найскладніших етапів лікування. Одним із дієвих методів є застосування модифікованих пластиночних (button) швів, що дозволяють зменшити натяг країв рани та забезпечити надійну їхню адаптацію.

Мета. Оцінити ефективність модифікованої техніки пластиночних швів при відтермінованому вторинному закритті великого дефекту м'яких тканин обличчя та шиї у пацієнта з бойовою вогнепальною травмою.

Матеріали і методи. Продемонстровано клінічний випадок лікування пацієнта 42 років із наскрізним вогнепально-осколковим пораненням лівої щічної, піднижньощелепної та шийної ділянок, великим дефектом м'яких тканин та багатоуламковим переломом кута нижньої щелепи. Вторинне хірургічне втручання виконано на 11-ту добу після травми після підготовки рани та стабілізації стану. Поліамідні нитки 3/0 проводили крізь товсті фіброзні тканини за допомогою ін'єкційних голок великого діаметра. Зовнішню фіксацію здійснили за допомогою пластикових гудзиків (2-3 см), що забезпечило рівномірний розподіл натягу.

Дослідження проведено із дотриманням принципів Етичного кодексу Всесвітньої медичної асоціації (Гельсінська декларація), що підтверджено висновком Комісії з питань біоетики ВНМУ ім. М. І. Пирогова. Від пацієнта отримано погодження для публікації даних за умов збереження конфіденційної інформації.

Результати. Пластиночні шви дозволили зблизити краї рани без надмірного натягу та уникнути прорізування тканин. Загоєння проходило первинним натягом, без ускладнень. Міжщелепну фіксацію зняли через 1,5 місяця, відзначено добру консолідацію фрагментів нижньої щелепи та відновлення оклюзії. Через 1,5 місяця після лікування сформувався щільний, але функціонально незначущий рубець.

Висновки. Модифікована техніка пластиночних швів є ефективною методикою для вторинного відтермінованого закриття великих дефектів м'яких тканин обличчя та шиї при вогнепальних пораненнях. Застосування гудзиків забезпечує рівномірний розподіл навантаження, зменшує ризик прорізування швів та сприяє загоєнню первинним натягом. Метод може широко використовуватись у практиці військової та цивільної щелепно-лицевої хірургії.

Ключові слова: вогнепальні поранення; пластиночні шви; регенерація; дефект тканин; вторинна хірургічна обробка рани; щелепно-лицева ділянка.

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