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A clinical case

Clinical Alertness in Trauma with Underlying Endocrine Pathology: Acute Compartment Syndrome and Debut of Type 1 Diabetes

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Abstract

Acute compartment syndrome is a severe and life-threatening condition that develops due to increased pressure within a confined fascial space. This pathological process causes impaired microcirculation, tissue ischemia, necrosis, and loss of limb function. Acute compartment syndrome is most frequently associated with high-energy injuries and fractures of long bones. However, its occurrence in combination with the onset of type 1 diabetes mellitus is extremely rare and has been described only in a limited number of clinical reports. We present the case of a 45-year-old male who sustained a low-energy distal fracture of the radius of the left forearm. Initial management included closed reduction and plaster immobilization. Subsequently, due to metabolic decompensation manifested by severe hyperglycemia, glucosuria, and ketonuria, the patient developed acute compartment syndrome of the forearm. This was further complicated by phlegmon of the hand and forearm, sepsis, and the formation of secondary purulent lesions. Laboratory testing confirmed the new diagnosis of type 1 diabetes mellitus. The coexistence of acute compartment syndrome and type 1 diabetes mellitus was aggravated by several pathophysiological mechanisms. These included diabetic microangiopathy, impaired microcirculation, decreased tolerance of tissues to ischemia, immune dysfunction, and delayed reparative processes. A critical unfavorable factor was the patient's low adherence to medical recommendations. Refusal of urgent hospitalization and the persistence of plaster immobilization resulted in delayed fasciotomy and progression of tissue necrosis. Surgical treatment consisted

of extensive multi-incision fasciotomy, necrosectomy, and subsequent skin grafting. Postoperative management included broad-spectrum antibacterial therapy, intensive fluid and transfusion support, and insulin therapy. A multidisciplinary approach involving trauma surgeons, general surgeons, endocrinologists, and anesthesiologists was essential for achieving a favorable outcome. This case highlights the necessity of considering endocrinological pathology as a significant risk factor in trauma patients. Early diagnosis and timely fasciotomy remain the only effective methods to prevent irreversible disability and mortality.

Keywords: acute compartment syndrome, onset of type 1 diabetes mellitus, fasciotomy, case report.

1. Introduction

The initial presentation of diabetes mellitus (DM) in conjunction with the development of compartment syndrome is exceedingly rare, primarily documented in isolated case reports. Such instances hold significant clinical interest because an acute surgical complication may represent either a consequence of the metabolic disease or its very first manifestation. A limited number of patients have been described in the available literature where the onset of DM was complicated by compartment syndrome following either infectious-inflammatory processes or local trauma. This particular case highlights a rare combination the simultaneous debut of DM and upper extremity compartment syndrome which underscores the critical importance of considering endocrine pathology as a potential risk factor when evaluating the causality of an acute surgical process.

The patient was fully informed about the nature of the illness and the interventions performed, and provided written consent for the publication of this clinical observation in accordance with the principles of the Helsinki Declaration.

2. Clinical Case Description

A 45-year-old male sustained an injury on March 25, 2023, following a fall onto his left hand. The next day, he presented to the trauma center at the National Scientific Center of Traumatology and Orthopedics named after Academician N.D. Batpenov (Astana, Republic of Kazakhstan). He was diagnosed with a closed fracture of the distal radial metaepiphysis of the left forearm with displaced bone fragments. The patient underwent closed manual reduction and application of a plaster splint. Following consultation, he was advised to follow-up as an outpatient at his place of residence but failed to seek further medical attention. Four days post-trauma, the patient noted worsening pain and increasing edema, prompting his return to the emergency department. After clinical and radiological assessment, the plaster cast was adjusted, and aseptic dressings were applied. Despite recommendations for immediate hospitalization, the patient adamantly refused inpatient treatment.

His condition subsequently deteriorated, marked by intensified pain, increased edema, impaired hand function, and a rising body temperature to 38.5 C. Upon his second presentation, he was urgently admitted to the Department of Purulent Surgery. Examination revealed marked edema and hyperemia of the forearm and hand, localized hyperthermia, pitting edema (pastiness) of the skin, and fluctuation in the lower third of the forearm and over the dorsal surface of the hand. Movement in the wrist joint was severely restricted, although sensation and radial artery pulsation remained intact (Figure 1 and 2).

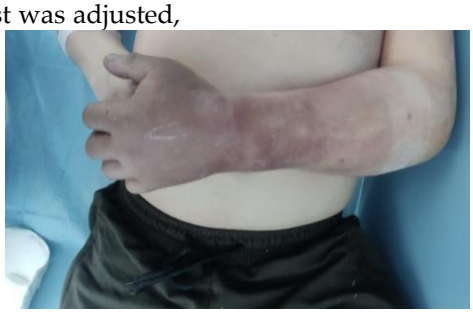

Figure 1 – On admission, the patient's left forearm presented with marked edema and cutaneous cyanosis following the removal of the plaster cast

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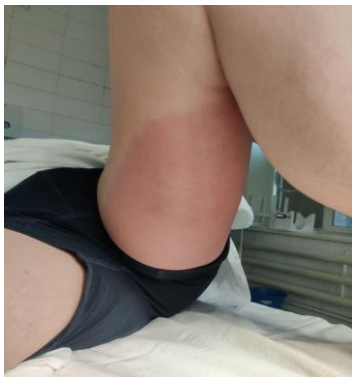


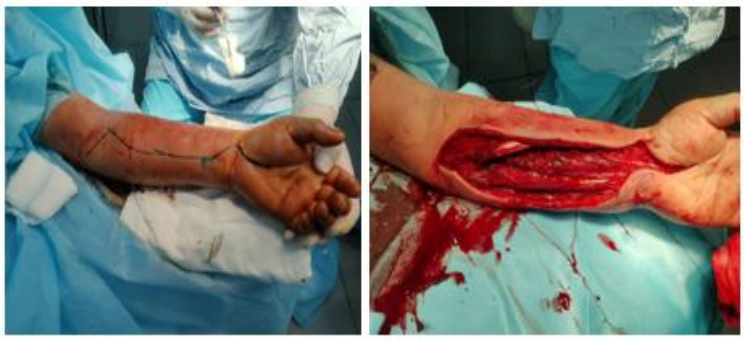
Figure 2 – patient's left thigh: localized hyperemia and soft tissue infiltration in the area of phlegmonous inflammation

Soft tissue ultrasound showed pronounced edema and signs consistent with phlegmonous inflammation. Duplex ultrasound of the lower extremity arteries and veins revealed no pathological changes. Chest radiography detected bilateral perihilar focal pneumonia. Laboratory tests demonstrated leukocytosis (16.34×109/L), elevated C-reactive protein, moderate anemia, severe hyperglycemia (21.46 mmol/L), glucosuria, and ketonuria. Given the high blood glucose level, Type 1 DM was diagnosed for the first time.

Bacteriological analysis of the purulent discharge isolated cephalosporin-resistant Staphylococcus aureus and Streptococcus pyogenes. This finding was crucial for guiding antibiotic selection and necessitated the use of reserve agents.

Based on the clinical presentation, the following diagnoses were established: Post-traumatic acute osteomyelitis of the left forearm bones; Phlegmon of the left hand and forearm; Closed fracture of the distal radial metaepiphysis of the left forearm with displaced bone fragments (Status post closed manual reduction and plaster immobilization); Compartment syndrome; Sepsis; Bilateral polysegmental pneumonia in the consolidation stage; Respiratory failure (RF) Grade 0–1; and initial diagnosed Type 1 DM.

The patient underwent a fasciotomy, which involved an extensive S-shaped skin incision along the palmar surface of the left hand, extending to the volar surface of the forearm up to the elbow joint. An additional longitudinal incision was made along the dorsal surface of the left hand over the second and fourth metacarpal spaces (Figure 3, 4, and 6). A longitudinal fasciotomy of all flexor and extensor muscle compartments was performed, followed by conservative debridement within viable tissue margins. Purulent, cream-like exudate containing fragments of lysed subcutaneous fat was obtained throughout the wound, and a specimen was collected for bacteriological culture (Figure 5).



A B

Figure 3 – S-shaped extended incision for fasciotomy (A) and debridement (removal of necrotized tissue); (B) along the palmar surface of the left hand

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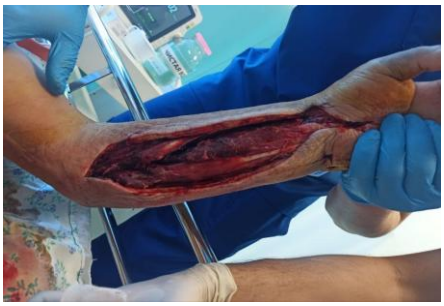

Figure 4 – Condition of the wound two days post-fasciotomy (on the 2nd postoperative day)

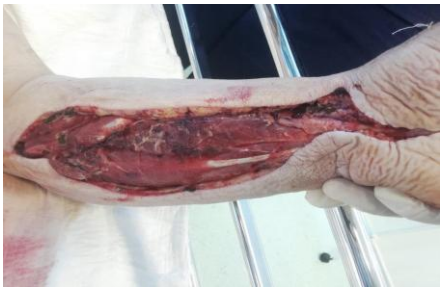

Figure 5 – Condition of the wound four days post-fasciotomy (on the 4th postoperative day)

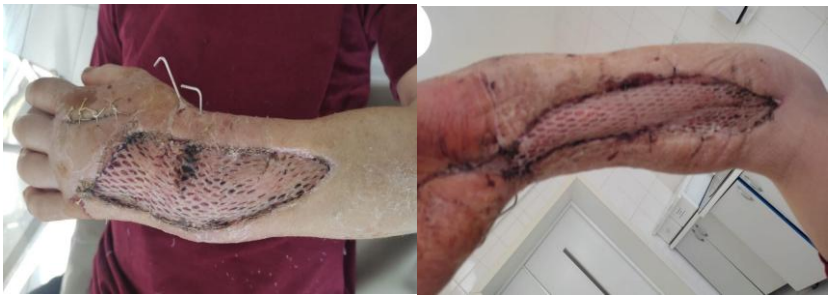

Figure 6 – Osteosynthesis of the left forearm's radial bone using Kirschner wires (K-wires) and autodermoplasty with a split-thickness skin graft

The postoperative regimen included intensive infusion-transfusion therapy (albumin, plasma, packed red blood cells), aggressive antibiotic therapy (meropenem, vancomycin, moxifloxacin, metronidazole), analgesia, and intensive insulin regimen. On Postoperative Day 10, a second-look surgery was performed to remove non-viable tissue. On Postoperative Day 20, osteosynthesis of the left radial bone was performed using pins, followed by autodermoplasty with a split-thickness skin graft (Figure 7).

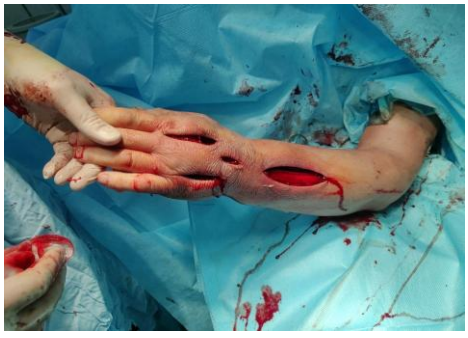

Figure 7 – Longitudinal incisions on the dorsal surface of the left hand over the 2nd and 4th metacarpal spaces

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3. Discussion

Acute Compartment Syndrome (ACS) remains a relatively rare but extremely threatening pathology that requires timely surgical intervention. Epidemiological studies indicate that the upper extremities account for only 10–11% of all ACS cases, with the forearm being the most common site. The primary causes include long bone fractures (≈65%), soft tissue injuries (≈30%), and vascular impairment (≈4%) [1]. Consequently, the development of ACS in a patient with a low-energy distal radial metaepiphysis fracture combined with the onset of DM represents a clinical phenomenon outside the typical spectrum of this pathology.

Type 1 DM, particularly at its onset and in the context of ketoacidosis, significantly influences the course of ACS. Key pathogenetic mechanisms include diabetic microangiopathy, impaired microcirculation, reduced tissue tolerance to ischemia, immune dysfunction, and delayed reparative processes [2-4]. These changes contribute to the rapid development of necrotic processes and the generalization of infection. Isolated observations described in the literature confirm that DM can act not only as a pre-existing condition but also as a direct trigger for ACS development, including its spontaneous forms [2, 5, 6] (Table 1).

Table 1 – Published Clinical Cases of Diabetes Mellitus Combined with Compartment Syndrome

Authors	Year	Localization (Site)	Outcome	Co-morbid DM
Smith AL, Laing PW. [2]	1999	Both legs	Recovery	Type 1 DM (Diagnosed 11 years prior)
Pamoukian VN, Rubino F, Iraci JC. [6]	2000	Right leg	Recovery	Type 1 DM (Diagnosed 24 years prior)
Mahdi H, Gough S, Gill KK, Mahon B. [5]	2007	Right leg	Recovery	Type 1 DM (Diagnosed 2 months prior to the case)

A significant negative modifying factor in the presented case was the patient's low adherence to medical recommendations. Refusal of emergency hospitalization amid increasing edema and pain, coupled with the retention of plaster immobilization, led to a delay in decompression. For ACS, the effective therapeutic window is only 6–12 hours. Late intervention leads to irreversible muscle necrosis and the development of systemic complications, including sepsis [1, 7–9].

In this case, it was likely the delay in surgical aid, alongside metabolic decompensation, that determined the severity of the infectious process and the outcome of the disease.

In the setting of DM onset and metabolic decompensation, clinical symptoms can be non-specific. Manifestations such as edema, hyperemia, and pain are often interpreted as signs of cellulitis, deep vein thrombosis, or local phlegmon. This creates a risk of diagnostic error and delayed surgical intervention. The leading clinical signs that should raise suspicion for ACS remain disproportionate pain, which intensifies with passive movement, and a tight edema of the fascial compartments. If these are present, an immediate decision regarding fasciotomy is required, as conservative management is ineffective [1, 10].

The surgical approach in this case adhered to current international guidelines (AAOS, BOA) and involved extensive fasciotomy, debridement, and subsequent skin grafting. Fasciotomy was fundamentally important because, in compartment syndrome, increased intracompartmental pressure leads to muscle and nerve ischemia. The only reliable method of decompression remains the incision of the fascial envelopes [11]. It's crucial to remember that reversible ischemia doesn't always imply reversible damage: even with timely treatment, elevated pressure in the upper extremity can lead to persistent neurological deficits and loss of hand function [12].

Classically, forearm decompression is performed using incisions on both the volar (palmar) and dorsal surfaces. Some studies discuss the possibility of a single volar incision with pressure monitoring, but the evidence base for this remains limited [13]. In the presented case, the standard technique was performed with S-shaped incisions on the volar and dorsal surfaces. This ensured adequate opening of both the superficial and deep muscle compartments, reduced

pressure, and prevented tissue necrosis. Alternative, less invasive decompression methods have been described in the literature, but their effectiveness remains low, and open fasciotomy continues to be the "gold standard" for severe compartment syndrome.

Optimal results were achieved through a comprehensive approach, including surgical intervention, antibiotic therapy, intensive infusion-transfusion support, and endocrinological correction [7,9,13]. The collaboration between surgeons, endocrinologists, and anesthesiologists played a leading role in this process, which is particularly vital when traumatic pathology is combined with severe metabolic decompensation.

The presented case highlights several key points of practical significance:

- DM, including its initial presentation, is a significant risk factor for ACS development and substantially worsens its course by leading to microangiopathy, impaired microcirculation, delayed edema resolution, and reduced tissue regenerative potential.
- Low patient adherence to medical recommendations can be a decisive factor in worsening the prognosis, especially given the limited "therapeutic window".
- Early fasciotomy at the first signs of the syndrome remains the sole method for preventing limb loss.
- Optimal treatment outcomes are only possible with interdisciplinary management involving a surgeon, trauma/orthopedic surgeon, endocrinologist, and anesthesiologist.
- Clinical vigilance among physicians must be high when combining traumatic injuries and endocrine pathology, even following low-energy trauma.

This case therefore demonstrates the multifactorial nature of ACS pathogenesis when combined with trauma and DM onset. It underscores the importance of early diagnosis and an interdisciplinary approach, while also highlighting the need to inform patients about the risks of complicated trauma courses in the context of endocrine pathology.

5. Conclusions

ACS is a critical condition resulting from increased pressure within a confined fascial space, leading to microcirculatory impairment, tissue ischemia, and potential limb loss in the absence of timely decompression. The presented clinical case illustrates a rare combination of the initial presentation of Type 1 DM and acute upper extremity compartment syndrome following low-energy trauma. In the context of metabolic decompensation, DM should be considered not merely as a background condition but as a significant modifying factor that accelerates ischemic-necrotic processes and increases the risk of infection generalization.

The outcome of the disease is largely determined by the timeliness of surgical intervention, but additional unfavorable factors, such as the patient's poor adherence to medical recommendations and delayed hospitalization, significantly worsen the prognosis. Diagnostic difficulties arise from the similarity of ACS symptoms to those of infectious-inflammatory and vascular complications, demanding a high degree of clinical vigilance from physicians when treating patients with co-existing trauma and endocrine pathology.

Optimal treatment results are achievable only through a comprehensive, interdisciplinary approach involving a surgeon, orthopedic trauma specialist, endocrinologist, and anesthesiologist, along with the early diagnosis and correction of metabolic disorders.

Conflicts of Interest. The authors declare no conflicts of interest.

Author Contributions: Conceptualization – V.T.; Methodology – B.S.; Validation – R.A., A.A.; Formal Analysis – M.R., Zh.R., and A.K.; Writing (Original Draft Preparation) – A.D.; Writing (Review and Editing) – V.T, A.D.

References

1. Herrmann, P., Eidmann, A., Hochberger, F. F., Heinz, T., Rak, D., Weißenberger, M., Rudert, M., & Stratos, I. (2024). Epidemiological Analysis of Traumatic Compartment Syndromes in Germany. Journal of clinical medicine, 13(6), 1678. https://doi.org/10.3390/jcm13061678

2. Smith, A. L., & Laing, P. W. (1999). Spontaneous tibial compartment syndrome in Type 1 diabetes mellitus. Diabetic medicine: a journal of the British Diabetic Association, 16(2), 168–169. https://doi.org/10.1046/j.1464-5491.1999.00020.x

3. Tan, L., Xia, Y., Su, Z., Wen, Q., Zhang, J., & Yu, T. (2021). Brachial muscle injury resulting in acute compartment syndrome of the upper arm: a case report and literature review. BMC musculoskeletal disorders, 22(1), 545. https://doi.org/10.1186/s12891-021-04318-1

4. Balakhonova E.A. (2023) Skeletno-myshechnye narusheniia pri sakharnom diabete (Skeletal-muscular disorders in diabetes mellitus) [in Russian]. Sakharnyi diabet, 26(3):275-283. https://doi.org/10.14341/DM12985

5. Mahdi, H., Gough, S., Gill, K. K., & Mahon, B. (2007). Acute spontaneous compartment syndrome in recent onset type 1 diabetes. Emergency medicine journal: EMJ, 24(7), 507–508. https://doi.org/10.1136/emj.2007.046425

6. Pamoukian, V. N., Rubino, F., & Iraci, J. C. (2000). Review and case report of idiopathic lower extremity compartment syndrome and its treatment in diabetic patients. Diabetes & metabolism, 26(6), 489–492.

7. Ang, A., Michaelides, A., Hallworth, S., & Kocher, H. M. (2022). Intraoperative acute compartment syndrome of the upper limb secondary to extravasation. BMJ case reports, 15(5), e248454. https://doi.org/10.1136/bcr-2021-248454

8. Jorgensen, A., Kahan, J., Moran, J., & Halim, A. (2022). Assessment of complications associated with casting of acute distal radius fractures in adults. The American journal of emergency medicine, 56, 124–126. https://doi.org/10.1016/j.ajem.2022.03.017

9. Doarn, M. C., & Carlson, M. S. (2021). Exercise-induced bilateral upper-arm anterior and posterior compartment syndrome with rhabdomyolysis. Journal of shoulder and elbow surgery, 30(3), e129–e131. https://doi.org/10.1016/j.jse.2020.10.005

10. Miranda-Klein, J., Howell, C. M., & Davis-Cheshire, M. (2020). Recognizing and managing upper extremity compartment syndrome. Jaapa, 33(5), 15- https://doi.org/10.1097/01.JAA.0000660124.51074

11. von Keudell, A. G., Weaver, M. J., Appleton, P. T., Bae, D. S., Dyer, G. S. M., Heng, M., Jupiter, J. B., & Vrahas, M. S. (2015). Diagnosis and treatment of acute extremity compartment syndrome. Lancet (London, England), 386(10000), 1299–1310. https://doi.org/10.1016/S0140-6736(15)00277-9

12. Prasarn, M. L., & Ouellette, E. A. (2011). Acute compartment syndrome of the upper extremity. The Journal of the American Academy of Orthopaedic Surgeons, 19(1), 49–58. https://doi.org/10.5435/00124635-201101000-00006

13. Barvelink, B., Reijman, M., Smidt, S., Afonso, P. M., Verhaar, J. A., & Colaris, J. W. (2024). Redisplacement of reduced distal radius fractures in adults: does the type of casting play a role? The CAST study, a multicentre cluster randomized controlled trial. The Bone & Joint Journal, 106(7), 696-704. https://doi.org/10.1302/0301-620X.106B7.BJJ-2024-0014.R1

Эндокриндік патология аясындағы жарақат кезіндегі клиникалық жағдай: Жедел компартмент-синдром және I типті қант диабетінің дебюті

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Түйіндеме

Жедел компартмент-синдром – шектеулі фасциальды кеңістікте қысымның жоғарылауымен сипатталатын ауыр патология. Бұл жағдай микроциркуляцияның бұзылуына, тіндердің ишемиясына, некрозға және аяқ-қол қызметінің төмендеуіне алып келеді. Көбінесе жедел компартмент-синдром ұзын сүйектердің сынуымен қатар жоғары энергиялық жарақаттар кезінде дамиды. Сонымен қатар, оның қант диабетінің I типінің алғаш анықталған жағдайымен қатар жүруі өте сирек кездеседі және медициналық әдебиеттерде тек жекелеген клиникалық бақылаулар түрінде ғана кездеседі.

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Бұл жұмыста төмен энергиялы дистальды метаэпифиздің сынуы фонында алғаш рет 1-типтегі қант диабеті анықталған 45 жастағы ер адамдағы жоғарғы аяқ-қолдың жедел компартмент-синдромының клиникалық жағдайы сипатталған. Алғашқыда науқасқа жабық репозиция жасалып, гипстік иммобилизация салынды. Кейіннен айқын гипергликемия, глюкозурия және кетонуриямен көрінетінен метаболикалық декомпенсация аясында жедел компартмент-синдромы дамып, ол қол мен білектің флегмонасымен, сепсиспен және екіншілік іріңді ошақтардың түзілуімен асқынған. Ауру ағымының ауырлауына ықпал еткен негізгі патогенетикалық факторлар диабеттік микроангиопатия, микроциркуляцияның бұзылуы, тіндердің ишемияға төзімділігінің төмендеуі, иммундық дисфункция және регенерация үдерістерінің баяулауы болды. Сонымен қатар, науқастың медициналық ұсынымдарға бейімсіздігі де теріс әсер етті: ол стационарлық емдеуден бас тартып, гипстік иммобилизацияны ұзақ сақтаған, бұл декомпрессияның кешіктірілуіне әкелді. Хирургиялық емдеу кең көлемді фасциотомияны, некроэктомияны және кейінгі тері пластикасын қамтыды. Операциядан кейінгі кезеңде науқасқа кең ауқымды антибактериалды терапия, инфузиялық-трансфузиялық қолдау және инсулинотерапия жүргізілді. Хирургтар, эндокринологтар және анестезиологтар қатысқан мультидисциплинарлық тәсіл оң нәтижеге қол жеткізуге мүмкіндік берді. Ұсынылған клиникалық жағдай эндокриндік патологияны жарақат кезінде маңызды қауіп факторы ретінде ескеру қажеттігін көрсетеді. Уақтылы диагностика мен ерте фасциотомия мүгедектік пен өлімнің алдын алудың жалғыз тиімді тәсілі болып қала береді.

Түйін сөздер: жедел компартмент-синдром, I типті қант диабетінің дебюты, фасциотомия, клиникалық жағдай.

Клиническая настороженность при травме на фоне эндокринной патологии: Острый компартмент-синдром и дебют диабета 1 типа

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Резюме

Острый компартмент-синдром представляет собой критическое состояние, возникающее вследствие повышения давления в ограниченном фасциальном пространстве. Данное состояние приводит к нарушению микроциркуляции, ишемии тканей, некрозу и утрате функции конечности. Наиболее часто острый компартмент-синдром развивается при высокоэнергетических травмах, сопровождающихся переломами длинных костей. Однако сочетание данного осложнения с дебютом сахарного диабета первого типа встречается крайне редко и описано в литературе единичными клиническими наблюдениями. В представленной работе описан случай острого компартмент-синдрома верхней конечности у 45-летнего мужчины, у которого на фоне низкоэнергетического перелома дистального метаэпифиза лучевой кости впервые был выявлен сахарный диабет первого типа. Первоначально пациенту была выполнена закрытая репозиция и наложена гипсовая иммобилизация. В дальнейшем на фоне метаболической декомпенсации, проявившейся выраженной гипергликемией, глюкозурией и кетонурией, развился острый компартмент-синдром, осложненный флегмоной кисти и предплечья, сепсисом и формированием вторичных гнойных очагов. Ключевыми патогенетическими механизмами, утяжеляющими течение заболевания, стали диабетическая

микроангиопатия, нарушение микроциркуляции, снижение толерантности тканей к ишемии, иммунная дисфункция и замедленные процессы регенерации. Дополнительным неблагоприятным фактором явилась низкая приверженность пациента медицинским рекомендациям: отказ от экстренной госпитализации и сохранение гипсовой повязки привели к отсрочке декомпрессии. Хирургическая тактика включала широкую многоразрезную фасциотомию, некроэктомию и последующую кожную пластику. В послеоперационном периоде проводилась интенсивная антибактериальная терапия, инфузионно-трансфузионная поддержка и инсулинотерапия. Междисциплинарный подход с участием хирургов, эндокринологов и анестезиологов позволил достичь благоприятного исхода. Представленный случай подчеркивает необходимость учитывать эндокринную патологию как значимый фактор риска при травмах. Своевременная диагностика и ранняя фасциотомия остаются единственным способом предотвращения инвалидизации и летального исхода.

Ключевые слова: острый компартмент-синдром, дебют сахарного диабета первого типа, фасциотомия, клинический случай.