

Some Features of Mine-Explosive Wounds due to Hostilities Using Unmanned Aerial Vehicles - Combat Drones

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Abstract

Background: The use of unmanned aerial vehicles (UAV) - combat drones, becomes increasingly relevant and important in modern local armed conflicts. They are used not only for intelligence, but also for combat tasks. It should be noted that UAV can cordially change the course of a modern war, with a lesion of living force and military equipment. This was the reason for increasing the number of combatants with a mine-explosive injury (MEJ), in the zone of anti-terrorist operation/operation of the united forces (ATO/OUF) in the east of Ukraine. However, as it turned out, the MEJ using UAVs has its own peculiarities that have a significant impact on the structure and magnitude of sanitary losses. That is why this problem has a significant scientific interest and requires a greater study.

Methodology: The report of the reports of the wounded in the ATO/OUF zone, information on general accessible electronic sources, military-historical portals and magazines are used. The bibliometric, structural and logical analysis, analytical, system approach is used.

Results: The MEJ due to the use of UAVs have its own peculiarities. Analyzing impressive factors can be distinguished by clear differences that may have an impact on the therapeutic tactics of such combatants, in particular: 1) the direction of a shock wave - ammunition can be burst at a certain height; 2) directing the temperature factor - high temperature and flame; 3) scattering of fragments and particles of explosive device and secondary traumatic elements; 4) features of mechanical damage - slaughter of areas of body when struck; 5) barotrauma - a change in the fluctuation of atmospheric pressure; 6) toxic effects of gaseous products at the explosion level; 7) acoustic injury.

In MEJ using UAV, there are three zones of changes in injured tissues: 1) irreversible changes - a zone of separation, crushing and tissues; 2) focal irreversible processes - a contusion zone; 3) structural changes in blood vessels and nerve trunks are a communion zone. Also, such combatants have a significant polymorphism of anatomical damage: damage to the chest organs with hemopneumotorax and heart slaughter, eye damage, bones of the face and brain skull, damage to the abdominal cavity and extremities. The main factors for the formation of the body's reaction to the IMP are: 1) afferent pain impulses from numerous lesions; 2) bleeding from several sources; 3) development of hypoxia of mixed genesis; 4) structural damage to various organs. Also, periods of clinical course are distinguished: 1) the period of shock and other acute disorders, due, directly, by the wound (12 - 48 hours); 2) an early after render period (a period of numerous organ dysfunction and insolvency of injured organs) - from 3 to 7 days; 3) the period of infectious complications or a significant risk of their development (from 2 weeks to month or more); 4) a period of delayed reconvalescence or trophic disorders (from a few weeks to several months). In our opinion, these features should be taken into account when providing assistance and treating such wounded.

Conclusion: Analyzing data made conclusions that key differences in the MEJ using UAVs are: 1) combined character of damage (mechanical, thermal, chemical); 2) the plurality of damage; 3) combined nature of damage (different parts of the body); 4) predominance of heavier "fatal" damage; 5) legumoral localization of damage (various anatomical plots); 6) mainly multilateral damage to damage; 7) the complexity of defeat (need for narrow-profile specialists); 8) Multi-typical nature of mechanical and braid injuries with different seven channels; 9) a combination of open and closed damage (open wound and closed breaks of internal organs); 10) an increase in the number of combatants with lesions despite individual protection means - the presence of weak zones. Separately, it should be added that the severity of MW with UAVs depends on the explosion distance.

Keywords: Mine Explosive Injuries; Unmanned Flying Devices; Combat Drones; Sanitary Losses

Introduction

ATO/OUF in the east of Ukraine binds to the Medical Service of the Armed Forces of Ukraine a large number of issues regarding the organization and provision of medical assistance to the victims of the MEJ. Among the variety of injuries arising during hostilities, the MEJ occupy the first place in severity. The MEJ is one of the most severe and specific types of wounds in the structure of combat injury. This kind of injury is often combined, with damage to several anatomical sites. The MEJ is a combined trauma that arises as a result of the impulse action of the striking factors of an ammunition explosion and is characterized by interconnected and interconnected influence, significant tissue damage, the development of a general contuser-commodity syndrome. MEJ in the Great Patriotic War amounted to 2.7%, Vietnamese conflict - 12.6%, in the Afghan conflict - 25.0%, during the Chechen War in the Caucasus - 15%, US war in Afghanistan and Iraq 2001 - 23.5% [1].

The frequency of sanitary losses during hostilities as a result of the MEJ is about 5%. At this stage, the development of military technologies the most progressive direction was the development and implementation of unmanned weapons systems - terrestrial, air, underwater. In fact, it remotely controlled combat complexes that are completely or mainly managed by people - operators from special control points. BPL today is not something unusual, especially in military affairs. The smallest military unmanned combatant can be worn in his pocket. And the largest, in essence, is a full-fledged aircraft, but without a pilot's cab. It can round-the-clock in the air, waiting for a good occasion to strike. One of the first remotely controlled systems in the history of world wars became unmanned aerial, apparatus - UAV. The first function for them was intelligence, but very soon the military wanted to be able to use them as shock - fighting. At the beginning of the "zero" decided two trends - non-camicado-kamikadze (rather small and high-speed) and dramulers - carriers of means of lesions of the type of guided missiles or bombs (quite large, with a huge flight range and tangible time finding in the air. At present, Western states develop UAVs whose buildings are made using Stealth technology, they are invisible to radars and can fly to combat duty and even carry small nuclear charges on board [4]. The United States, the global leader in the development of combat drones that actively used UAVs in its military operations in Iraq and Afghanistan, liquidated Al Qaeda, Taliban and other terrorist organizations. The war between Armenia and Azerbaijan has fully shown the benefits of the use of combat drones. According to literary sources [2], the enemy in eastern Ukraine uses a variety of UAVs for intelligence and combat tasks (Figure 1).



Figure 1: Unmanned aerial vehicle (UAV) T23 complex Eleron-3.

In the literature we accessed, we did not find messages about the peculiarities of the hurt and the structure of sanitary losses from the use of unmanned aerial vehicles - combat drones in modern armed conflicts.

Goal of the Work

To investigate the peculiarities of the factors of defeat and nature of the wounds of combatants in the zone of ATO/OUF, as a result of shelling using unmanned aerial vehicles - combat drones.

Materials and Methods

The report of the reports of the wounded in the ATO/OUF zone, information on general accessible electronic sources, military-historical portals and magazines are used. The bibliometric, structural and logical analysis, analytical, system approach is used.

We analyzed the MEJ combatants with the use of enemy of UAVs - combat drones in military defense forces in the ATO/OUF zone in the last year. The total number of wounded amounted to 23 servicemen. The age of wounded ranged from 21 to 42 years, on average (27 ± 3.0).

Results of Research

Analyzing the nature of the wounded wounds from UAV - combat drones, it was found that in most cases, combat shells of Fire-17, Fi-25 were used (Figure 2).



Figure 2: Combat shells for use of UAV.

In 11 (48%), the injured state was regarded as severe, which was due to severe blood loss and the severity of the injuries received (damage), with hemorrhagic shock. In 9 (39%) of the wounded state is considered medium weight, 3 (13%) of the injured state was satisfactory, injured were not difficult. The nature of the wounds had differences, which were characterized by lesion of all areas of the trunk - heads, chest, abdomen and extremities (Figure 3).



Figure 3: Combatant R., 29 years old. MEJ with multiple firearms combined injuries of the chest, abdominal cavity, fire fracture of the right thigh defect of the skin and muscles. Right hemopneumothorax. Wounding the right fate of the liver, the liver corner of the colon. Hemoperitoneum. Call peritonitis. Hemorrhagic shock of the III stage.

In our opinion, such a severe nature of the wounds was due to the charge scattering of which the element next to the wounded or the height of growth, which was achieved by sighting accuracy of UAV. The nature of the injuries was multiple and combined: with penetrating injuries of the chest and abdomen in areas unprotected from individual protection means (side areas of body armor and helmet. On the battlefield in places of wounds received assistance provided combat doctors. Time, from the moment of injury to evacuation at the stage of an advanced medical brigade or a mobile hospital with the II level of assistance, averaged (45 ± 20) min. After the survey in the conditions of the anti-shore, all extremely heavy and severe injured were operated and stabilized with "Damage Control" tactics and evacuated by aeromestic evacuation at III level of assistance. Lightweight injured with insignificant damage to soft tissue and extremities, signs of narotrans evacuated by automobile sanitary transport. The total mortality rate was 5 (21.7%) of cases, four servicemen died from severe injuries with massive bleeding and penetrating the nature of the wounds, of which: three on the battlefield; one in a mobile hospital from massive intraperitoneal bleeding with the injury of the right fate of the liver and the inner of the indigenous vein; one serviceman died from complications after gained injuries with the development of surgical sepsis for 23 days at the stage of highly specialized assistance.

By studying the use of UAVs in order to point target lesions on the example of the war between Armenia and Azerbaijan, it was found that the entire personnel of the forces that ensure the functioning of Armenian tanks, artillery, as well as air defense systems, which were destroyed in the short term. The use of UAVs on the Donbass only grows - throughout the line of combat collisions. The means of radio-electronic struggle in some directions are fixed for 5-6 departures per day. In conditions of limitation of the use of heavy artillery and positional war on the Donbass, the role of UAV and danger from them will only increase, as well as the goals they can attack [3].

The most famous dramuler during the current exacerbation in Karabashi became Turkish shock Bayraktar TB2. Most videos of strikes for directions in Karabakh, which spread Azerbaijani military, experts are attributed to him. This UAV, developed by the Turkish Baykar company several years ago, is capable of operating under the control of the operator or independently, it can be used for exploration, ob-

servation or defeat. He carries a guided bomb with a laser guide Mini Akilli Mühimmat - "Intelligent minibots" manufactured by the Turkish company ROKETSAN ROKET SANAYII VE TICARET A.S. Turkey applied them in Syria during an operation "Spring Shield" in February 2020, and to this in Libya, where Bayraktar TB2 acted against the Homemia of the chapter.

Discussion

The MEJ due to the use of UAVs have its own peculiarities. Analyzing impressive factors can be distinguished by clear differences that may have an impact on the therapeutic tactics of such combatants, in particular: 1) the direction of a shock wave - ammunition can be burst at a certain height; 2) directing the temperature factor - high temperature and flame; 3) scattering of fragments and particles of explosive device and secondary traumatic elements; 4) features of mechanical damage - slaughter of areas of body when struck; 5) barotrauma - a change in the fluctuation of atmospheric pressure; 6) toxic effects of gaseous products at the explosion level; 7) acoustic injury.

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Conclusion

Thus, analyzing the obtained MEJ data from the use of UAVs in 48% of the injured state was difficult, in a 39% state was the average degree of severity due to heavy combined multiple penetrating hurt all the anatomical areas with bleeding and hemorrhagic shock. With the development of severe complications in the postoperative period and lethality 21.7%. In such wounded requires a clear observance of "DAMAGE CONTROL" tactics, both in the volume of surgical and anesthetic assistance. Key differences in the MSP using UAVs are: 1) combined character of damage (mechanical, thermal, chemical); 2) the plurality of damage; 3) combined nature of damage (different parts of the body); 4) predominance of heavier "fatal" damage; 5) legumor localization of damage (various anatomical plots); 6) mainly multilateral damage to damage; 7) the complexity of defeat (need for narrow-profile specialists); 8) multi-typical nature of mechanical and braid injuries with different seven channels; 9) a combination of open and closed damage (open wound and closed breaks of internal organs); 10) an increase in the number of combatants with lesions despite individual protection means - the presence of weak zones. Separately, it should be added that the severity of MEJ with UAVs depends on the explosion distance. Aiming precise beat of a combat projectile from UAVs leads to severe injuries and significant sanitary losses. In case of use of several UAVs with severe weapons, sanitary losses will be significant with high fatality on the battlefield.

The raised topics requires further in-depth scientific study, because the introduction of modern methods of conducting warpages to military doctors - surgeons, anesthetics all new tasks that are aimed, as always, to preserve the most valuable life in modern armed conflicts.

Conflict of Interest

The authors declare the lack of conflict of interest in preparing this article. The contribution of authors to the preparation of the article: Gumeniuk K.V. collection and processing of the material of the wounded, the idea of publication, research design. Horoshko V.R., Gumeniuk N.I. collection, processing of materials, analysis of data obtained, writing text, drawing.

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