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Reconstructing the Lazdėnai battle: Integrating historical and forensic perspectives

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Abstract

This study presents a forensic anthropological investigation of human remains discovered at the site of the Battle of Lazdėnai (1920), a conflict during the Lithuanian-Polish War (1919–1920). The remains of 14 individuals were analysed using forensic anthropological methods, including the assessment of taphonomic changes, biological profiles and perimortem trauma. The results were combined with the archaeological context and historical sources to reconstruct the circumstances of death and aspects of the battle. The study demonstrates the importance of an interdisciplinary approach to the investigation of historical conflicts and the reconstruction of past violent events.

Introduction

Forensic anthropology is an increasingly interdisciplinary field of science, with historical studies of conflicts gaining in prominence. The importance of this science is well documented, not only for the purpose of identifying victims of conflicts but also in elucidating crucial elements that complement the historical context (Klepinger 2006). It is significant to note that in contemporary global practice, the boundaries between anthropology and archaeology are becoming blurred. The two disciplines are no longer perceived as distinct and unrelated fields, but rather as complementary aspects of a unified field of inquiry (Dirkmaat 2008). In contrast to the work of anthropologists in the early decades of this century, contemporary research is not solely focused on establishing a biological profile and then basing the identifications of individuals upon this forensic analysis alone (Cunha 2006). Although the primary objective of such research is the identification of the remains, the circumstances surrounding the death are of considerable importance and should be viewed in a much broader context – before, during and after death. Consequently, the involvement of anthropologists in the work in situ is a vital aspect of such research (Dirkmaat 2008).

It is crucial to recognise that forensic anthropology is a field that is increasingly engaged with the study of contemporary deaths and crimes. Forensic anthropologists, in conjunction with forensic doctors, constitute an indispensable component of the disaster victims identification (DVI) team. However, with the involvement of archaeologists in the research of events that occurred in the 20th century, and the subsequent formation of the field of forensic archaeology, the involvement of anthropologists in such research also became relevant. It is notable that in forensic archaeological investigations, bioarchaeological research methods and the study of paleopathology are frequently employed. Nevertheless, when undertaking detailed studies of conflicts from the 20th century, it is advisable to employ the methodology of forensic medicine and anthropology, and to consider not only paleopathology but also modern diseases and forensic pathology (Cunha and Cattaneo 2006). In light of global practices and emerging methodological recommendations, this study undertook a comprehensive examination of a historical

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battle, encompassing antemortem, perimortem and postmortem analysis. Postmortem assessment is particularly important because some damage occurring during the early postmortem period may mimic perimortem trauma and can therefore complicate the interpretation of skeletal injuries. Evaluating the taphonomic context, including how the remains were handled, transported and buried, may help distinguish postmortem damage from injuries sustained around the time of death, thereby reducing the risk of both over- and under-diagnosis of trauma. The methodology employed was adapted from contemporary research practices to facilitate the investigation of historical events. It is hoped that this study will demonstrate the value of applying forensic anthropological methods in the study of historical conflicts, both in terms of what can be achieved and why this is important.

The aim of this study is to reconstruct the circumstances of death of individuals killed in the Battle of Lazdėnai by analysing the pattern, distribution and characteristics of skeletal trauma, and to evaluate the contribution of forensic anthropological evidence to the reconstruction of the historical events surrounding their deaths. To achieve this aim, an anthropological investigation was conducted on the remains of 14 individuals who perished during the Lithuanian-Polish conflict in the Battle of Lazdėnai: (1) the taphonomic profile of the mass grave was established, including the assessment of the preservation of the remains; (2) the biological profile of the individuals was established; (3) the circumstances of death and the nature of the perimortem trauma sustained by the victims were reconstructed; (4) the findings were contextualised through comparison with evidence from other historical conflicts and analogous cases from contemporary disaster studies; (5) a probable scenario of the battle was proposed by integrating the anthropological findings with available historical sources.

1. Historical context

The beginning of the 20th century in Europe was marked by dramatic events, often echoed in current politics. The events of World War I (1914–1918) brought new developments to the political map of the Old Continent. The defeat of the powers that dismantled the Polish-Lithuanian Commonwealth fostered the rebirth of oppressed nations under the rule of three emperors. For many nations enslaved by the Tsar, a time of freedom had arrived, which precipitated the formation of new nation-states. The decaying Russian Empire gave way to the Bolsheviks led by Vladimir Lenin. Against the backdrop of the end of World War I and the national rebirth and formation of the states of Poland and Lithuania, conflict erupted. United by the centuries-old tradition of the Polish-Lithuanian Commonwealth, dating back to the 16th century, the nations rose against each other on the threshold of their independence. Particularly powerful, and fuelled by intense emotions, the uprisings took place in the former lands of the Grand Duchy of Lithuania, on the modern-day Lithuanian-Belarusian border. The axis and cause of the conflict was the national affiliation of Vilnius and the Vilnius region. Vilnius was the former capital of the Grand Duchy of Lithuania, the seat of the Lithuanian princes. Although historically part of Lithuania, due to centuries of Polonisation and the influence of Polish culture (particularly cultivated during the Tsar's rule), its population overwhelmingly spoke Polish and felt connected to the reborn Polish state. Both Lithuanians and Poles desired Vilnius for themselves. As Audrius Žulys rightly noted, in the lands of the former Grand Duchy of Lithuania, the principle of national self-determination promoted by US president Woodrow Wilson (1856–1924) and the emerging norms of the new international order gave way to power politics: territorial disputes were settled not by agreement but by military force and faits accomplis (Żulys 2015, p. 29). Dreams of a common Polish-Lithuanian state, although promoted by such eminent figures for the Vilnius region as Tadeusz Wróblewski (1858–1925) and Mykolas Romeris (Michał Pius Römer, 1880–1945), found little support or justification (Łossowski 1985, p. 81). The concept of the nation-state was the only solution. Conflict was inevitable.

While World War I was still in progress, in September 1917, the government of the German Reich agreed to convene a Lithuanian conference, which, on 18–22 September in Vilnius, established the Council of Lithuania (Lietuvos Taryba in Lithuanian), headed by Antanas Smetona (1874–1944). Its primary goal was to declare Lithuanian independence and gain international recognition. This was a tactical move by Germany, aimed at buying time. Without further delay, the Council of Lithuania issued a declaration of independence on 16 February 1918. As Wiktor Sukiennicki, a Polish sovietologist associated with Vilnius, wrote, 'All twenty original members of the Council of Lithuania gathered, not in the new official headquarters, but in the separate premises of the Lithuanian War Relief Committee.' Under the chairmanship of the non-partisan patriarch, Jonas Basanavičius (1854–1927), they unanimously resolved to publish the declaration of 'Lithuania's independence' (Sukiennicki 1984, p. 669). German military defeats on the front led to a change in position. After Germany's defeat in September 1918 on the Western Front, Lithuania again asked Germany for recognition of its sovereignty, which it obtained in exchange for permission for German troops to be stationed on Lithuanian territory. This situation prevented the Poles from developing their administration. From the Polish point of view, the reborn Lithuanian state was considered a project of German imperialism (Piłsudski 1937, pp. 41–42), and

therefore contrary to Polish interests. Vilnius was becoming a place of convergence of many political interests, and whoever had the military potential (or its support) ruled the city. Despite the real threat of the approaching Bolsheviks, Poles and Lithuanians did not reach an agreement on the joint defence of Vilnius. In early January 1919, Polish units of the Vilnius Self-Defence, under the command of General Władysław Wejtko (1859–1933), occupied the city as the Bolsheviks approached from the east. Meanwhile, the Germans abandoned the city. On 5 January 1919, Vilnius was occupied by the Bolsheviks. The Council of Lithuania government evacuated to Kaunas (on 2 January1919), while its plenipotentiary, Mykolas Biržiška (1882–1962), remained in Vilnius, demanding that the Poles recognise Lithuania with its capital in Vilnius.

The Poles reoccupied the city on 19 April 1919. Józef Piłsudski arrived in the city with the intention of establishing a federal government. His famous address 'To the inhabitants of the former Grand Duchy of Lithuania' did not find favour among Lithuanians. In 1920, during the Polish-Soviet War, a peace treaty was concluded in Moscow between Lithuania and Soviet Russia on 12 July, in which, among other things, the boundary of their new border was established. The Bolsheviks awarded the entire Vilnius region with Vilnius, Lida, Ashmyany, and Grodno to Lithuania in exchange for permission for the Red Army to march through its territory. At the same time, the previously mentioned Romeris, who was close to the political events, wrote in his diary:

July 14, 1920, Wednesday. The most important news – that Lithuania had completed peace negotiations with Russia and that the peace treaty would be signed immediately. This indicates that the Bolsheviks did not consider it advisable to exploit their situation after the victory over Poland against Lithuania, which could have pushed it into Poland's arms. On the other hand, this indicates that Lithuania ultimately chose not to enter into special agreements with Poland, and will not receive the inheritance of its former occupation from Poland, as Poland proposed last week, but by virtue of its state rights sanctioned by the current peace with Russia. Therefore, if the Poles do not hold on to Vilnius, which is unlikely, it will be taken over not by the Bolsheviks, but by Lithuania. If Russia now signs a treaty with Lithuania, it means that it will not seize the territory granted to it. (Römer 2018, p. 67)

In June 1920, Soviet forces commanded by General Mikhail Tukhachevsky (1893–1937) launched an offensive towards Vilnius. Three Soviet armies pushed the Polish First Army from its positions. In response, the Poles sent two battalions of the 76th Infantry Regiment to Vilnius, arriving on 8 July. Faced with the overwhelming Bolshevik forces and the deteriorating situation on the front, Polish troops were forced to withdraw from Vilnius on 13–14 July. Lithuanian troops adopted an increasingly offensive stance. General Stasys Nastopka (1881–1939), commander of the active Lithuanian Army, issued a special order stating that the time had come to return Lithuania to its capital, Vilnius. The order called for the capture of the territory up to the Foch Line and entry into Vilnius ahead of the Bolshevik forces (Łossowski 1996, p. 119). At that time, Lithuanian troops attacked Polish outposts in the area of Dūkštas, Nemaitonys and Butrimonys. The 1st Battalion of the 76th Infantry Regiment, retreating from the Suwałki region, encountered Lithuanian resistance and fought a battle near Rykantai on 12 July. In these circumstances, amidst the military reinforcement of Lithuanian forces moving from Kaunas towards Vilnius and the Poles' attempts to repel them, one of many Polish-Lithuanian clashes occurred. A train carrying Lithuanian soldiers travelling from Kaunas to Vilnius was attacked by Poles near the Lazdėnai (Zawiasy) station. It is likely that ten Lithuanian and four Polish soldiers died as a result of the fighting. Fourteen Lithuanian and Polish soldiers who died in the battle were buried in a common grave (Fig. 1).

It should be added that surviving documents and studies created immediately after the war do not fully confirm the number of casualties. This was due to obvious logistical shortcomings and the nature of the war. The lack of complete lists of combat participants, including volunteers, and the arrival and departure of soldiers from units was a daily occurrence. The inability to constantly monitor numbers was reflected in the documentation. This was, and remains, the greatest challenge for researchers – establishing possible facts and personal details of soldiers killed in combat. The list of war losses incurred between 1914 and 1920 was maintained by the Polish side. These findings were verified by the Polish Red Cross, while studies on the combat operations of individual regiments (in this case, the 76th Infantry Regiment) were created by soldiers – direct combat participants. The Military Historical Office (Polish: Wojskowe Biuro Historyczne) supported the emerging historical work, verifying the findings and providing scientific support. Despite their best efforts, however, the reports lacked precision, as historians discovered while conducting research and establishing the facts about Lazdėnai. The soldier Feliks Łatwis, according to a report from the 76th Infantry Regiment of the Polish Army, was killed in action, which was untrue. The same erroneous information can be found in the monumental work *Lista strat wojska polskiego: polegli i zmarli w wojnach 1918–1920* (Wojskowe Biuro Historyczne, 1934).

Another challenge in verifying data on wartime losses and determining the exact number of soldiers killed is incomplete documentation. This applies to gaps in both Polish and Lithuanian archives. Therefore, not all information regarding the course of the fighting and casualties can be determined or verified. However, we can assume with a

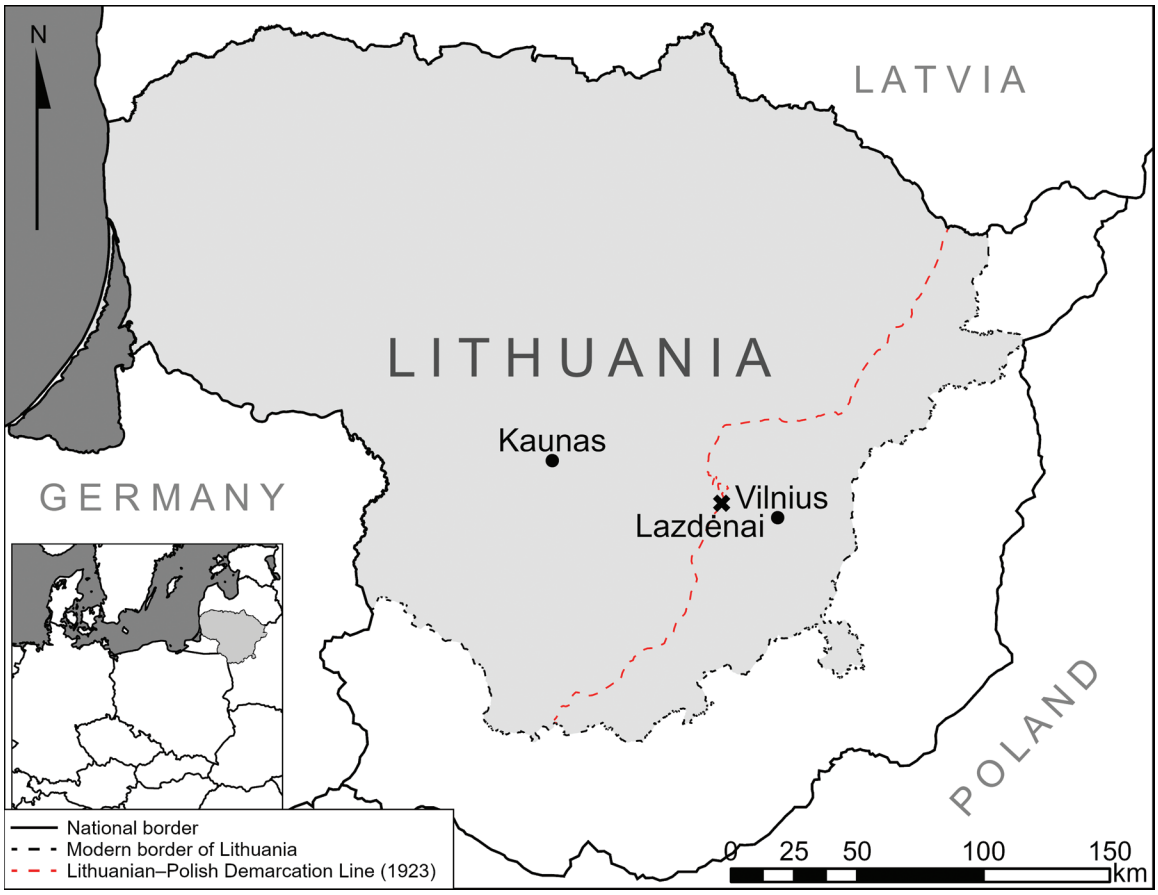


Figure 1. The Lithuanian–Polish state border in the interwar period and the location of the Battle of Lazdėnai and the original burial site of the remains (marked with an X). Map created by Rūta Karaliūtė.

high degree of probability that the skirmish, the clash at Lazdėnai (13–14 July 1920) (Fig. 1), was a continuation of the fighting at Rykantai (12 July 1920), as indicated by the direction of attack, the involvement of individual units, and the records regarding the location of the soldiers' deaths (around Rykantai, Lazdėnai and Vievis). All three of those battle locations are in fact often described as 'fighting at Rykantai', although the clashes shifted to other locations and obviously stretched over a period of time. The units involved in the Battle of Rykantai were deployed along a demarcation line approximately 120 km long. The Polish 76th Infantry Regiment, which was manning the line, received new orders; consequently, its 1st Battalion was ordered to march to Lentvaris (Landwarów). The 1st Company, delayed during its 70 km march to the battalion's assembly point at Rykantai, encountered the vanguard of a Lithuanian division advancing along the road from Kaunas to Vilnius.

While the personal details and the number of fallen soldiers in official documents still require further research, information regarding the grave's location can be considered certain. During the interwar period, the grave was known and cared for. In 1938, after the establishment of diplomatic relations between the Republic of Poland and the Republic of Lithuania, railway workers serving the Zawiasy railway station (then Trakai commune), along with Sergeant Arciszewski, commander of the Korpus Ochrony Pogranicza 'Zawiasy' (the Polish name for Lazdėnai is Zawiasy) cleaned up the burial site. A tombstone with a cross was erected, and white acacia trees were planted around it (*Głos Ziemi* 1938). The grave did not survive in its original form and was forgotten for decades. In 2018, during archival research at the Lithuanian Central State Archives (LCVA), a list of Lithuanian Army soldiers buried in Vilnius, Trakai, Varėna, Dūkšiai, Leipalingis, Bortelė, Maišiagala and Lazdėnai was obtained. This list was created for the purpose of transferring it to the Lithuanian side after the establishment of diplomatic relations in 1938.

2. Material and methods

The remains exhumed in the village of Lazdėnai during the course of archaeological research conducted in 2022 were subjected to analysis at the Faculty of Medicine of Vilnius University between September 2022 and January 2023. The search for the grave and exhumation were conducted as part of the routine work of the Institute of National Remembrance (Instytut Pamięci Narodowej, IPN) in Lithuania. The IPN conducts searches for the remains of

Polish soldiers and other victims of armed conflicts with the aim of recovering, identifying where possible, and providing them with a dignified reburial. Such investigations involve the archaeological examination and documentation of suspected burial sites, followed by the exhumation and examination of the recovered human remains. In this case, the search was undertaken as part of these ongoing efforts to locate and recover the remains of individuals who died during the Lithuanian-Polish conflict.

Initial attempts to locate the common grave of Polish and Lithuanian soldiers who fell in the battle were unsuccessful. Efforts undertaken by the Lithuanian side did not yield the expected result: the Elektrėnai municipality organised search operations in late 2021, but unfortunately neither the burial site nor the remains of the fallen soldiers were found during the work. In 2022, through cooperation with the Consulate of the Republic of Poland in Vilnius, a team from the IPN's Office of Search and Identification joined the grave search project. Research and the analysis of archival and cartographic materials made it possible to identify the burial site. A breakthrough came from Polish sources. A map created by the Military Geographical Institute (Polish: Wojskowy Instytut Geograficzny) marked the location of the grave in question. Cross-referencing the information on the map with the actual terrain produced the desired result. It turned out that the grave was situated on the opposite side of the Kaunas–Vilnius railway line from where it had previously been assumed to be. Just a few dozen metres from the railway line, there lay a neglected grave with a cross.

The grave of Polish and Lithuanian soldiers was located along the Vilnius–Kaunas railway line (at the 31 km mark), approximately 700 m from the Lazdėnai (Zawiasy) railway stop and 50 m west of the tracks. The coordinates are: 54°45'12.2"N 24°56'00.6"E (Google Maps). There was no vehicular access to the point; the nearest dirt road is about 500 m away. The site is heavily overgrown with vegetation and situated within the wooded strip along the railway corridor. It appears to have remained undisturbed (neither destroyed nor noticed by the public) likely due to its secluded location within the railway's safety zone. The burial site bore no markings. The grave measured approximately 2.5–3 m by 4–4.5 m and was oriented northwest-to-southeast, parallel to the tracks. The grave was in a damaged state, covered with grass and topsoil. A concrete element is visible, potentially running the entire length of the grave. The concrete was of poor quality and crumbles easily; it is of a basic type typical of the material used in the interwar period for cemetery headstones and fencing components. Neither a headstone nor a burial mound was visible. The grave cross consisting of intersecting welded metal elements (approx. 1.20 m high; made of iron pipes with a diameter of approx. 4–5 cm, lacking additional structural components) has become overgrown by a nearby acacia bush, making it difficult to pinpoint the object's exact location or accurately assess the period to which it dates.

It is crucial to underscore that the remains were initially presented on the assumption that they represented the burials of the victims of the Battle of Rykantai. Subsequently, following a comparison of the results of the anthropological and archaeological research with the archival data, and the acquisition of further details concerning the circumstances and findings of the archaeological research, this hypothesis was rejected. It seems probable that the soldiers interred at the aforementioned location perished approximately two months prior to the Battle of Rykantai (Antropikaitė-Oleinik 2023).

The study covers three parts: taphonomic and biological profiles; circumstances of death reconstruction answering relevant questions related to a person's death; and the treatment of their remains after death and the identification. Although the main goal of such research is the identification of individuals, in the context of historical conflict research and forensic archaeology, it is important not only to identify the deceased but also to investigate the circumstances of historical events and reconstruct them as accurately as possible.

The general layout of the mass grave and the positions of individual bodies were assessed, allowing the reconstruction of both individual and collective taphonomic profiles. This approach is crucial for understanding the historical event behind the burial: the grave must be examined as a crime scene (Dirkmaat 2008, 2012), considering the entire sequence from the digging of the pit to the order (or disorder) of deposition, the orientation of bodies and the degree of overlap between them (Dupras et al. 2012, p. 70). Such an analysis helps to reconstruct the burial process itself and to distinguish genuine perimortem trauma from damage to fragile bones that occurred during early stages of decomposition, when bone still retains properties that can make postmortem fractures appear similar to perimortem injuries (Holz et al. 2015). Therefore, the origin and mechanism of trauma can only be reconstructed accurately when the depositional context of the remains is taken into account.

Preservation of the skeletal material was assessed using 29 general preservation parameters. The taphonomic profile was further studied by documenting colour changes in the bones that reflected environmental and decomposition conditions. These alterations were recorded macroscopically, without separate chemical analyses. The conditions of skeletonisation were reconstructed following the guidelines of the *Taphonomy of Human Remains* manual (Shotsmans et al. 2017) and by comparison with documented case studies from other European anthropological investigations (Garvin and Langley 2019).

The biological profiles of the individuals were also established, including sex, age and stature. Sex and age estimation followed the standards of Tim D. White and Pieter A. Folkens (2005), as well as Jane Buikstra and Douglas H. Ubelaker (1994). Sex determination was based primarily on the morphology of the pelvis, sacrum and skull, while age was assessed through changes in the pubic symphysis, the auricular surface of the ilium and the degree of clavicular ossification. These methods provided a reliable framework for identifying demographic characteristics of the buried individuals.

Trauma was investigated through detailed macroscopic and microscopic examination. Each fragment and fracture line was studied using a microscope and magnification under LED lighting to capture both macro- and micro-morphological features. Fragments were not glued or consolidated in order to avoid altering the remains, but where perimortem fragmentation was present, fracture lines were aligned and examined from both sides to better evaluate tensile and compressive forces and the direction of impact (Čižas 2008). In this way, the distribution of forces and the mechanisms responsible for bone breakage could be reconstructed with greater accuracy.

Trauma was divided into broad categories of blunt force, sharp force, projectile and explosive injuries. Blunt force trauma was the most commonly observed, including linear, hinge, depressed and irregular fractures (Kranioti 2015), as well as Le Fort-type injuries affecting the facial skeleton (Funk 2023). No sharp force trauma was identified in this study. Projectile trauma, primarily gunshot injuries, was documented through analysis of entrance and exit morphology and the spread of radial fractures (Byers 2007; Kriukov 1986), with cranial remains showing the clearest patterns (Quatrehomme and Iscan 1999). Long-bone gunshot injuries were more complex but were examined for characteristic features such as conical or butterfly fractures and keyhole-shaped defects; archaeological finds of bullets and their fragments supported these identifications (Veenstra 2002). Explosive trauma was recognised as particularly complex, combining elements of blunt, sharp and thermal damage. Blast-related injuries were grouped into primary (caused by the shock wave), secondary (caused by shrapnel), tertiary (caused by displacement of bodies or objects) and quaternary (burns, asphyxia, toxic exposure) (Galante et al. 2021). The documentation of these findings included diagrams of fracture types, their propagation and their likely mechanisms. Taken together with the taphonomic and archaeological evidence, this allowed for a reconstruction of the probable circumstances of death and the dynamics of the historical event reflected in the mass grave.

3. Results and discussion

3.1. Taphonomic profile

Looking at the overall situation of the mass grave (Fig. 2) and the two burial orientations, one possible explanation is that the pit contains fallen soldiers from two opposing armies. While this cannot be ruled out, it will be considered in more detail later in this article. Here, the focus is on the burial situation itself and the processes that took place after death both above and below ground. Several questions arise: in what order were the bodies placed? Who buried them, and how? Was the grave marked or maintained by locals, and when was it abandoned?

The analysis of individual positions shows disorder. Some individuals were placed on their backs (individuals 1, 8, 9, 10, 11, 12, 13 and 14), others on their sides (individual 7 on his right and individuals 2 and 5 on their left side) or stomachs (individuals 3, 4 and 6), with limbs entangled and overlapping those of neighbouring bodies. Several bodies entirely cover others, while in many cases arms and legs extend beneath or over adjacent skeletons. In some areas, the bones are so mixed that during laboratory analysis they had to be reassigned macroscopically to one or another individual. Traces of later soil disturbance partially destroyed the remains of at least one individual (individual 13). Within this grave, the positions of individuals 10 and 11 resemble more traditional burials, lying on their backs with arms crossed over the chest.

Based on the overlaps, the first to be placed in the pit were individuals 1, 6, 7 and 13, whose remains lie at the bottom and show the heaviest damage. The last were individuals 3 and 4, deposited in the centre and covering several others. The position of individual 8 suggests that at least two people were carrying out the burials, as his limbs overlap in a way that indicates simultaneous deposition with others. Overall, the process was chaotic: bodies were thrown in rather than carefully placed, and the orderly position of individuals 10 and 11 seems accidental rather than intentional. Still, disorder does not necessarily mean disrespect, it may reflect secrecy, haste or fear of lingering at the site. The use of chemicals, possibly to prevent disease, also suggests reluctance to handle the bodies directly. A similarly multi-directional grave situation has been recorded in other conflict investigations. For example, a study of a World War I mass burial in the mountains of Italy illustrates two likely scenarios: the remains could have been buried (or disposed of), most likely after the battle, by the enemy (which would be indicated by a disorderly, hasty and dismissive burial, with no emotion or energy invested in the ceremony itself); or the burial work could have been carried out by surviving soldiers, although this is less likely given the scattered manner of the burial, although in a dangerous situation they might have buried their



Figure 2. General view of the burial site. Photograph by the Institute of National Remembrance (Instytut Pamięci Narodowej, IPN). Note: The numbering shown in the photographs corresponds to the identification numbers used consistently throughout the analysis and matches the numbering of the human remains presented in Appendix A.

comrades very hastily (Gaudio et al. 2013). In the example discussed, due to the battle location being far from settlements, the possibility that civilians buried the soldiers was dismissed. This version of events, however, cannot be dismissed in the case of Lazdėnai.

The poorest preservation was seen in bodies at the bottom of the pit, especially individuals 6, 7 and 13, as they were damaged not only by the weight of those above but also by later infrastructure works in the area. This underlines the importance of excavating such graves before they are disturbed. Although studying similar sites is important for reconstructing the historical events themselves (Rinehart 2001), exhuming soldier graves is primarily necessary to identify them and provide proper burial, while research, identification and protection are greatly complicated, and sometimes impossible due to disturbance. Such examples are common in Slovakia, where systematic searches for soldiers are rare; most 20th-century graves are discovered accidentally and are already heavily disturbed by earth-moving activities, making identification rare due to the compromised integrity of the remains (Putško et al. 2021).

Poor preservation here was not only due to deposition and later disturbances. Decomposition itself creates micro-environments around each body, changing soil chemistry and accelerating decay in the centre of the burial mass. Comparable processes have been recorded in experimental research (Turner-Byfield 2010) as well as at other sites: the Iron Age mass grave of Alken Enge in Denmark, where bones were so disturbed that positions could not be reconstructed (Mollerup et al. 2016); a chaotic WWI grave in Veneto, Italy, with extensive postmortem damage (Gaudio et al. 2013); and the Resaca de la Palma battlefield in Mexico, where 27–36 soldiers were dumped in three overlapping layers, leaving the remains so fragmented that their number could not be determined precisely (Wescott et al. 2006). In all the above-mentioned cases, including Lazdėnai, individuals located in the middle of the pit were noted to be poorly preserved.

Historical sources help clarify the situation of the grave after the burials. The individuals were buried in 1920 (LCVA, f. 154, ap. 1, b. 2795, fols. 248–251), but the grave was neglected during the interwar period and only memorialised in 1938 (LCVA, f. 55, ap. 8, b. 748, fol. 2), after Lithuania and Poland restored diplomatic relations. It is important to note that the instability of the interwar state border, which was never fully established and, in some places, did not exist in physical form, makes it impossible to determine on which side of the border the Lazdėnai battlefield grave lay. While it is known that the

demarcation line crossed Lazdėnai, there is insufficient data on how this specific territory was divided. These historical context factors make it difficult to determine whose territory the grave was located in. Subsequent neglect of the grave likely occurred not only due to a lack of recognition by both Lithuanians and Poles but also due to its remote location near the railway, which made visitation difficult. These same factors contributed to its abandonment over time and eventually led to the 2022 exhumation (Antropikaitė-Oleinik 2023), conducted to make the site accessible for visitors.

Another taphonomic factor worth discussing is the presence of colour changes on the bones. Two main types were observed: black and green discolorations. Green spots can have either organic or inorganic origins. In this case, the green discoloration is likely inorganic, caused by contact with copper alloy artefacts (such as uniform details, bullets or shrapnel) which corroded during decomposition and stained the bone surfaces green or turquoise (Buikstra and Uberlaker 1994). Black discolorations can arise from two main sources. One is soil minerals: manganese and iron oxides can produce dark stains, with manganese causing black and iron red (Stermer et al. 1995; Brown et al. 2014). The second source is burning. Burn marks often appear in areas with thinner soft tissues, such as knees, elbows, femoral trochanters, mid-shafts of ribs, and shoulders (Christensen et al. 2014). In this case, the black discoloration indicates burning at roughly 300°C for about an hour (Schmidt and Symes 2007), with no evidence of calcification, suggesting the process did not exceed the three hours mark (Schmidt and Symes 2007).

These findings are relevant for identification: calcined bones lose organic components, complicating forensic analyses such as trauma reconstruction, post-mortem interval (PMI) estimation, and taphonomic assessment. Based on the evidence, copper alloy artefacts caused green discoloration in individuals 1, 3, 4, 5, 6, 9, 10, 12 and 14, while black discoloration indicates burning in individuals 1, 3, 4, 5, 9 and 12. Black or green discolorations in individuals 11 and 14 are less consistent with burning and are likely due to manganese oxidation during decomposition.

3.2. Biological profile

Estimation of sex and age showed that all individuals found at Lazdėnai were young adult males (under 40 years old). The oldest individuals were individuals 2 and 13, estimated at 30–40 years at death. Numerous soldiers (6 out of 14 individuals) were even younger, around 18 years old. The 20–25 and 23–28 age groups had two individuals each, and another two individuals were around 25 years old at the time of death. So, the vast majority (12 out of 14) were younger than 28 at the time of death. These results provide a clear profile of the fallen soldiers: all male, mostly young adults, with a significant portion (~43%) around 18 years old. Historical sources indicate that the Lithuanian army of the period largely consisted of young, inexperienced volunteers. After the first call-up in 1919, approximately 3000 joined, eventually increasing to around 10,000 (Surgailis 1998, p. 10). Combatants also included partisans and members of the Riflemen organisation (Lietuvos Šaulių sąjunga) (Surgailis 2014), who could be younger than 18, though their roles extended to education and cultural activities as well (Nefas 2019). Therefore, it cannot be ruled out that some individuals at Lazdėnai were younger than 18; the age range observed may reflect adolescent participation. Similar patterns occurred in World War I, where sources note that approximately 250,000 (Emden and Humphries 1998) boys under 18 served in the British armed forces, the youngest being only 12 (Henry 2009). While call-ups officially began at 20 and volunteer service at 18 (Sereičikas 2015), strict adherence to these age requirements was unlikely so soon after the war.

3.3. Perimortem traumas and circumstances of death

The study documented multiple perimortem injuries. According to the data, individuals 2 and 4 had no recorded perimortem injuries, while the highest number of such traumas was observed in individuals 13 and 14. Results (Appendix A) show that six individuals experienced bone fragmentation caused by explosive weapons, with four more suspected to have similar injuries. Most of these injuries affected the vertebrae. Two gunshot wounds were recorded: one in the chest of individual 1 and another in the right femur of individual 11. Due to extensive fragmentation, precise measurement of bullet entry points was not possible. Blunt force injuries were identified in five individuals, all likely secondary trauma resulting from explosions.

Interpreting the circumstances of death requires the integration of historical data, as anthropological analysis alone provides only a partial picture of the nature and location of injuries. Few historical sources relate to the event: (1) a newspaper note about a disturbed Kaunas–Vilnius railway, mentioning that four Polish soldiers died when they were ambushed and blew up a Lithuanian military train (*Kurjer Wileński* 1938, p. 5); (2) lists of the deceased, indicating the number of soldiers killed and, in the case of Polish soldiers, their names, although it is important to note that one list mentions four Polish soldiers and seven Lithuanians killed (LCVA, f. 154, ap. 1, b. 2795, fols. 248–251), while the other lists only four Poles (with their names specified) (*Lista strat Wojska Polskiego* 1934); and (3) a military history account citing 13 Polish fatalities (*Zarys historji wojennej 76-go lidzkiego pułku*

piechoty 1930, pp. 24–27). None of these sources fully reflect the archaeological reality of the 14 individuals found at Lazdėnai, but they allow interpretation of the conflict and circumstances of death, particularly in relation to the train explosion. Archaeological evidence, including glass fragments (D. Antropikaitė-Oleinik, pers. comm., 26 January 2023) found in the burial, supports the train explosion scenario.

The presence of glass fragments may explain deaths without perimortem bone injuries: shrapnel can fatally damage soft tissues or arteries without affecting bones (Mercadante and Raja 2023). Such injuries are known in clinical literature on suicides (Ventura et al. 2010; Bhattacharjee et al. 1997; Start et al. 1992), but secondary or tertiary blast trauma could similarly cause lethal soft tissue damage without leaving marks on bones (Galante et al. 2021). Confirming this would require the mapping of each fragment in situ relative to the skeleton. Other blast-related effects, such as asphyxia or gas poisoning, would also leave no skeletal traces (Ibid.).

Comparisons with modern disaster and train accident cases, including metro incidents studied using DVI protocols, illustrate patterns of blunt force and burn injuries similar to those observed here. Some injuries can be explained by even very recent events, thoroughly investigated by forensic anthropologists using not only contemporary, widely accepted methodologies but also working with the DVI programme. This programme increasingly involves not only police officers but also forensic anthropologists and archaeologists, and DVI standards are now used by researchers examining mass graves from world wars (de Boer at al. 2018). Carefully documented cases of mass disasters not only allow the identification of the deceased but also provide an opportunity to better understand and interpret historical conflict situations. The 2003 subway disaster in Daegu, South Korea, aids better understanding of the bodily burns suffered by individuals during a subway/train car explosion (Park et al. 2009). Injuries caused by blunt force mechanisms in both traffic accidents (Maujean et al. 2018, Ndiaye et al. 2009) and train disasters (Bibel 2012) are also illustrated by contemporary case studies.

Rib and vertebral injuries require careful analysis due to their fragility and susceptibility to postmortem fragmentation (Scheirs et al. 2018). Early decomposition can make postmortem damage appear like perimortem trauma. For example, individual 5's rib fractures likely resulted from other bodies being thrown on top, while ring fractures in vertebrae reflect compressive forces from being dropped or thrown into the pit. Such injuries, like ring fractures caused by force driving the head into the spine, are characteristic of falls from height and result in spinal fragmentation (Kranioti 2015). This highlights the importance of considering individuals within their broader context and not relying solely on medical evidence. For this reason, we must compare anthropological research results with known historical and archaeological data to reconstruct a version of events that is as close to the truth as possible (Dirkmaat 2008). Some injuries of the spine and costae, however, are consistent with the explosion itself. Vertebral compression in individuals 8, 9 and 13 likely resulted directly from the blast, matching patterns observed in historical mass casualty studies (Palmiotto et al. 2020). Even when some fragments were eroded, the morphology and distribution allow interpretation as explosion-related trauma.

Knowing that the explosion caused a train accident, it can be suggested that injuries typical of blunt force trauma in traffic accidents were sustained by individuals inside the train. This includes the Le Fort-type separation of the facial skeleton from the cranial vault observed in individual 9. It is well established that Le Fort fractures result from a sudden impact of a blunt object to the face, and such fractures are characteristic of accidents in which the face strikes a nearby hard surface (Byers 2007, p. 321). Individual 10's hip injury is also associated with an accident. In such cases, when a seatbelt is not worn and the person is lifted from the seat and then suddenly falls back onto it, injuries to the hip joints and pelvic bones are common (Rupp and Schneider 2004; Mandell et al. 2017).

Gunshot wounds were recorded in individuals 1 (chest) and 11 (right femur), though fragmentation and missing ballistic data prevented precise reconstruction. Firearm-related deaths may have occurred outside the train, as survivors could have engaged in nearby combat, and burn patterns can result from automatic weapons at close range without leaving clear bullet marks (Shrestha et al. 2023). Overall, combining historical accounts, archaeological evidence and forensic comparisons allows a more nuanced reconstruction of the Lazdėnai deaths, highlighting the complex interplay of blast, blunt force and firearm trauma within this chaotic wartime scenario.

4. Remaining questions

It is important to emphasise that even with detailed analysis of the circumstances of death, reconstruction often continues to be uncertain due to remaining unknowns. Current best practice worldwide encourages not separating remains from the site and the involvement of forensic anthropologists directly during fieldwork. Initial onsite examination reduces uncertainties, allows more accurate reconstruction of death circumstances and enhances identification. Without such collaboration, laboratory analyses alone often yield superficial results which are insufficient

for historians or archaeologists and complicate identification (Dirkmaat 2008).

Additional challenges in this study arise from poor preservation of remains, missing bone fragments and sparse or ambiguous historical sources. Based on anthropological analysis, four individuals, numbers 8, 9, 10 and 13, were likely inside the train during the explosion. Archaeological evidence complicates this further, and historical data raise additional questions. For example, uniform buttons from the Polish army found near individuals 9, 10, 11 and 13 (Antropikaitė-Oleinik 2023) prompt the following questions: Were the injuries to individuals 9 and 10 caused by the explosion, or could they have occurred on the battlefield? How far from the blast were the Polish soldiers, and could the shockwave have affected them? How many soldiers truly died on each side? Recent research shows that one supposed casualty, Feliks Łatwis, survived and later received medical treatment in Kaunas. If Łatwis is removed from the casualty list, who is the fourth Polish soldier killed? Does a uniform found on a body reliably indicate the side they fought for, given historical examples of soldiers wearing enemy attire as camouflage (Rowe 1994)? Is the battle analysed in this study definitively the one referenced in historical sources?

Overall, none of the historical sources fully match the archaeological and anthropological findings. These uncertainties highlight the need for further research and caution against definitive interpretations of the battle's course. Accurate understanding of the engagement may only be possible once some individuals are positively identified and linked to specific historical events. Nonetheless, this study illustrates the critical importance of forensic anthropological research in examining historical conflicts and the benefits of collaboration between archaeology, anthropology and history. This case joins others, such as the Battle of Memel (Kozakaitė et al. 2022) or the Zokniai prisoner-of-war camp (Čičiurkaitė 2022), where archaeological and anthropological evidence is the primary source of knowledge about events, as historical records remain silent.

Conclusions

Prior to this study, the Lithuanian-Polish War, despite attracting significant historical interest, has been minimally explored archaeologically and anthropologically. This is likely because exhumations and anthropological studies of soldiers' graves are usually carried out at the request of relatives seeking identification and the first half of the 20th century is generally too distant for such research. This makes the study of the Lazdėnai individuals unique as it is the only Lithuanian-Polish War site in Lithuania examined in detail by historians, archaeologists and anthropologists to date.

The Lazdėnai battle illustrates the complex situation of 1920, which was characterised by numerous small-scale battles, often initiated independently rather than directed by commanders. Such battles are undocumented and largely absent from historical sources. Consequently, anthropological and archaeological research provides nearly the only data available about these events.

Forensic anthropological analysis assessed the taphonomic profile of the deceased. Some taphonomic changes, such as traces of white powders, are linked to chemical disinfectants and soil fertilisers. Green stains on bones are associated with copper alloy artefacts (e.g. uniform buttons, tags, shrapnel or bullets) present near the body during decomposition. Black stains on bones are connected to soil minerals, specifically manganese oxide. Areas of blackening observed with perimortem bone fragmentation indicate burning at the time of death, likely resulting from explosive-induced fatalities. These findings underscore that neglecting taphonomic profiling can complicate subsequent analyses of death circumstances.

Biological profiling revealed that 14 male soldiers were killed and buried at Lazdėnai, all of them under 40 years of age. The results also suggest possible involvement of individuals younger than 18 in the conflict. Reconstructed circumstances of death support hypotheses about the battle's course. Anthropological evidence documented injuries consistent with explosives and firearms, as well as blunt force trauma typical in vehicle or train accidents. These findings support the assumption that the battle began with a train explosion. While the study could not determine the precise sequence of the battle, it raised numerous questions for future research, both at this site and at similar locations. The results highlight the importance of early, integrated collaboration among historians, archaeologists and anthropologists, ensuring that critical details and evidence are preserved.

This study demonstrates the importance of three key profiles: taphonomic, biological and circumstances of death. Detailed postmortem analysis is particularly crucial because some injuries recorded as perimortem may actually have occurred after death, potentially misleading interpretations. So, this research shows that modern forensic methods used in contemporary criminal investigations should be applied as well as adapted for the study of historical conflicts. Accurate reconstruction of events and identification of the deceased requires integration of bioarchaeological, archaeological, historical and forensic expertise.

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Abbreviations

Am. J. Phys. Anthropol. – American Journal of Physical Anthropology

Eur. J. Oral Sci. – European Journal of Oral Sciences

Forensic Sci. Int. – Forensic Science International

Forensic Sci. Med. Pathol. – Forensic Science, Medicine and Pathology

Int. J. Legal Med. – International Journal of Legal Medicine

Int. J. Osteoarchaeol. – International Journal of Osteoarchaeology

J. Archaeol. Sci. Rep. – Journal of Archaeological Science: Reports

J. Geoarchaeol. – Journal of Geoarchaeology

J. Forensic Sci. – Journal of Forensic Sciences

J. Forensic Leg. Med. – Journal of Forensic and Legal Medicine

Res. Rep. Forensic Med. Sci. – Research and Reports in Forensic Medical Science

Scand. J. Forensic Sci. – Scandinavian Journal of Forensic Science

Institutions

LII – Lietuvos istorijos institutas / Institute of Lithuanian History

LCVA – Lietuvos centrinis valstybinis archyvas / Lithuanian Central State Archive

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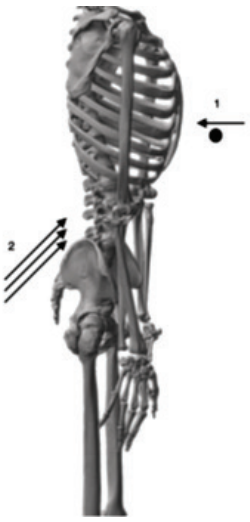
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Appendix A. Reconstruction of perimortem trauma patterns. Arrows indicate the direction of applied force; lines represent blunt force trauma caused by a broad impact surface; brackets indicate blunt force trauma caused by a localised impact surface; dots mark gunshot entry points. Sketches by Jovita Kadikinaitė-Mickė; skeletal model generated using Artec 3D scan by Artec Eva.

<table>
<tr><td colspan="3">Remains No. 1</td></tr>
<tr><td>Sex: Male</td><td>Age: ~18</td><td>Stature: ~183 cm</td></tr>
<tr><td colspan="3">Preservation: Sufficient</td></tr>
<tr><td colspan="3">Body position in the pit: On back, head oriented towards the NW</td></tr>
<tr><td colspan="3">Perimortem trauma: Fragmentation of the ribs, thoracic and lumbar vertebrae</td></tr>
<tr><td colspan="3">Buttons or tags for identification: British military uniform</td></tr>
<tr><td colspan="2">Concluded circumstances of death
Individual sustained a gunshot injury to the thoracic region, resulting in fragmentation of the ribs and thoracic and lumbar vertebrae. Based on the fracture patterns of the vertebrae (compressive forces acting on the spinous processes from the posterior side and tensile forces recorded on the internal surfaces), it is likely that, following an anterior gunshot injury to the chest, the individual fell backwards and sustained blunt force trauma upon impact with the ground. However, the exact entrance wound could not be reconstructed, as the bullet was recovered among highly fragmented ribs and its precise in situ location was not recorded.</td><td>Reconstruction of trauma-causing forces

</td></tr>
</table>

<table>
<tr><td colspan="3">Remains No. 2</td></tr>
<tr><td>Sex: Male</td><td>Age: ~30–40</td><td>Stature: ~177 cm</td></tr>
<tr><td colspan="3">Preservation: Sufficient</td></tr>
<tr><td colspan="3">Body position in the pit: On left side, head oriented towards the NW</td></tr>
<tr><td colspan="3">Perimortem trauma: None</td></tr>
<tr><td colspan="3">Buttons or tags for identification: US military uniform</td></tr>
<tr><td colspan="3">Concluded circumstances of death
No perimortem trauma was identified in the remains of the individual; the circumstances of death remain unknown.</td></tr>
</table>

<table>
<tr><td colspan="3">Remains No. 3</td></tr>
<tr><td>Sex: Male</td><td>Age: ~20–25</td><td>Stature: ~171 cm</td></tr>
<tr><td colspan="3">Preservation: Sufficient</td></tr>
<tr><td colspan="3">Body position in the pit: On stomach, head oriented towards the NW</td></tr>
<tr><td colspan="3">Perimortem trauma: Fragmentation of the right ulna and radius</td></tr>
<tr><td colspan="3">Buttons or tags for identification: US military uniform</td></tr>
</table>

Concluded circumstances of death Individual sustained trauma to the right forearm region. The radius was fractured at the proximal third, while the ulna was fractured at the midshaft. The injuries to both bones are likely related, although they do not exhibit a clear fracture pattern. The damage and fragmentation are consistent with blunt force trauma caused by an impact from an object with a broad surface, which likely affected the radius first and subsequently extended to the ulna.	**Reconstruction of trauma-causing forces** 

Remains No. 4		
Sex: Male	**Age:** ~20–25	**Stature:** ~184 cm
Preservation: Sufficient		
Body position in the pit: On stomach, head oriented towards the NW		
Perimortem trauma: None		
Buttons or tags for identification: None		
Concluded circumstances of death Individual did not exhibit clear perimortem trauma. However, the vertebral column was extensively fragmented, with all fracture edges severely eroded. The pattern of damage was similar to that observed in individuals 8, 9 and 13. Therefore, the remains were interpreted analogously, and the circumstances of death were considered consistent with blast-related trauma.		

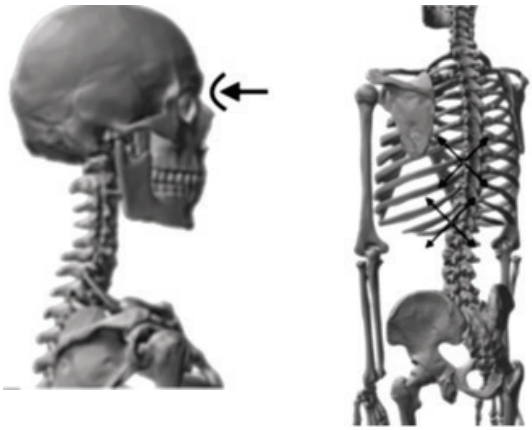
Remains No. 5		
Sex: Male	**Age:** ~23–28	**Stature:** ~171 cm
Preservation: Sufficient		
Body position in the pit: On left side, head oriented towards the NW		
Perimortem trauma: Fragmentation of ribs		
Buttons or tags for identification: None		
Concluded circumstances of death Individual exhibited extensive perimortem fragmentation of the left ribs. Based on the direction of the damage (multiple compressive forces affected the inferior surfaces of the internal aspects of the ribs), this unilateral crushing is most likely associated with the process of being thrown into the burial pit. The individual was likely deposited on their left side, with individual 4 placed on top of them.	**Reconstruction of trauma-causing forces** 	

Remains No. 6		
Sex: Male	**Age:** ~18	**Stature:** ~172 cm
Preservation: Poor		
Body position in the pit: On stomach, tilted onto right side, head oriented towards the NW		
Perimortem trauma: Fractures of the skull and vertebrae		
Buttons or tags for identification: US military uniform		
Concluded circumstances of death Individual exhibited perimortem fragmentation of the skull. The initial trauma was caused by a blunt force impact to the centre of the cranial vault (along the sagittal suture), while the subsequent trauma resulting in hinge fractures was caused by compression between two surfaces. The circular fractures observed in this individual indicate that the injury resulted from a force driving the head towards the spine. Such injuries are typically associated with falls from a height, where the head is the first point of contact with the ground. Considering the position of the body within the burial pit, the hinge and circular fractures are likely related to the deposition of the remains rather than the cause of death or trauma sustained during the battle.		**Reconstruction of trauma-causing forces** 

Remains No. 7		
Sex: Male	**Age:** ~18	**Stature:** ~189 cm
Preservation: Sufficient		
Body position in the pit: On right side, head oriented towards the NW		
Perimortem trauma: Fractured left temporal bone		
Buttons or tags for identification: None		
Concluded circumstances of death Individual sustained blunt force trauma to the left temporal region caused by an object with a localised impact surface. Explosion-related fragmentation of the vertebrae was also observed, however, the fracture margins were eroded.		**Reconstruction of trauma-causing forces** 

Remains No. 8		
Sex: Male	**Age:** ~18	**Stature:** ~173 cm
Preservation: Sufficient		
Body position in the pit: On back, head oriented towards the NW		
Perimortem trauma: Fractured thoracic and lumbar vertebrae		
Buttons or tags for identification: None		

Concluded circumstances of death	**Reconstruction of trauma-causing forces**
Individual exhibited perimortem trauma to the thoracic and lumbar vertebrae, including fragmentation of the vertebral arches, separation of the arches from the vertebral bodies, colour changes along the fracture margins, and sharp edges at the injury sites. Compressive forces acted on the vertebrae from the internal side. Such injuries are characteristic of explosion-related trauma.	

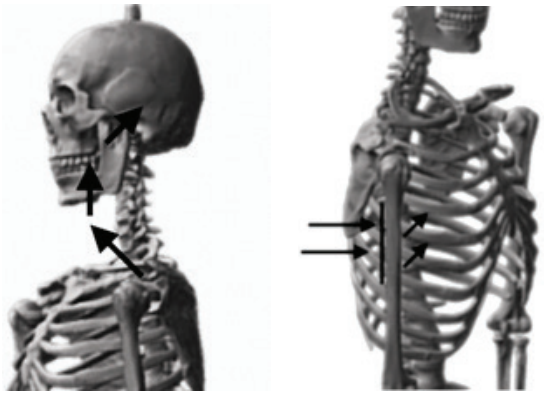
Remains No. 9		
Sex: Male	**Age:** ~18	**Stature:** ~170 cm
Preservation: Sufficient		
Body position in the pit: On back, head oriented towards the NW		
Perimortem trauma: Fractured skull and thoracic vertebrae		
Buttons or tags for identification: Polish military uniform		
Concluded circumstances of death Individual sustained explosion-related trauma to the thoracic vertebrae. Le Fort II fracture on the left side and Le Fort III fracture on the right side were observed in the skull. Such injuries are characteristic of high-energy impacts, where the face strikes a blunt object. In this case, the trauma was most likely caused by an impact to the frontal region near the superciliary arches and/or a blow to the nasal region.	**Reconstruction of trauma-causing forces** 	

Remains No. 10		
Sex: Male	**Age:** ~18	**Stature:** ~170 cm
Preservation: Sufficient		
Body position in the pit: On back, head oriented towards the SE		
Perimortem trauma: Fractured pelvis and a single hand phalange		
Buttons or tags for identification: Fragments of both Polish and US military uniforms		
Concluded circumstances of death Individual sustained trauma to the left pelvic bone, with the ischium becoming separated from the ilium perimortem. Such an injury is also characteristic of a sudden, high-energy impact from a blunt object with a broad, non-localised surface applied to the posterior hip region. Another recorded injury was a perimortem phalangeal fracture. Due to the absence of the remaining bone fragment, the injury pattern could not be reconstructed, however, it was most likely associated with an impact affecting only the fingers rather than the entire hand striking against a blunt object with a broad surface or a flat plane.	**Reconstruction of trauma-causing forces** 	

Remains No. 11		
Sex: Male	**Age:** ~25	**Stature:** ~166 cm
Preservation: Good		
Body position in the pit: On back, head oriented towards the SE		
Perimortem trauma: Fractured left femur		
Buttons or tags for identification: None		
Concluded circumstances of death Individual sustained a gunshot injury to the left femur. The entrance point of the projectile is visible on the anterior surface of the femur, with a downward-directed bevel. The gunshot caused radial fractures and subsequent fragmentation of the bone.		**Reconstruction of trauma-causing forces** 

Remains No. 12		
Sex: Male	**Age:** ~23–28	**Stature:** ~172 cm
Preservation: Poor		
Body position in the pit: On back, head oriented towards the SE		
Perimortem trauma: Fractured left clavicle		
Buttons or tags for identification: Polish military uniform		
Concluded circumstances of death Individual sustained a fracture of the left clavicle caused by a compressive force applied to the centre of the bone from the anterior direction. The injury was caused by an impact from a blunt object.		**Reconstruction of trauma-causing forces** 

Remains No. 13		
Sex: Male	**Age:** ~30–40	**Stature:** Not reconstructed
Preservation: Poor		
Body position in the pit: On back, head oriented towards the NW		
Perimortem trauma: Fractured right temporal bone, ribs and thoracic vertebrae		
Buttons or tags for identification: Polish military uniform		
Concluded circumstances of death Individual exhibited an unreconstructible perimortem fracture of the right temporal bone. Only a few cranial fragments remained, and this was the only fragment displaying a perimortem fracture line. The remains also exhibited perimortem fragmentation of at least three left and three right ribs, as well as perimortem trauma to the thoracic vertebrae: fractures of the spinous processes of T2–T3, perimortem fragmentation of the vertebral bodies and arches of T4–T5, and perimortem fractures of the transverse processes of T6–T7. The latter injuries were most likely caused by an explosion. The cranial and rib trauma may also have resulted from explosion-related forces.		**Reconstruction of trauma-causing forces** 

<table>
<tr><td colspan="3">Remains No. 14</td></tr>
<tr><td>Sex: Male</td><td>Age: ~25</td><td>Stature: ~174 cm</td></tr>
<tr><td colspan="3">Preservation: Sufficient</td></tr>
<tr><td colspan="3">Body position in the pit: On back, head oriented towards the SE</td></tr>
<tr><td colspan="3">Perimortem trauma: Fractured skull and right humerus</td></tr>
<tr><td colspan="3">Buttons or tags for identification: US military uniform</td></tr>
<tr><td colspan="2">Concluded circumstances of death
Individual sustained cranial trauma caused by a blunt object impacting the left side of the mandible from below. The high-energy injury resulted not only in fractures of the mandible, maxilla and temporal bone, but also in perimortem splitting of a tooth. The remaining cranial trauma was caused by compression from both sides of the parietal bones and is most likely associated with pressure on the remains within the burial pit, as the fracture lines show limited propagation. Irregular, multidirectional fractures of rib fragments were also recorded. In addition, the individual sustained a perimortem fracture of the right humerus at the proximal third, caused by compression from an external blunt object with a broad, non-localised surface. The humeral and rib injuries may be related, as they show a similar direction of force and were most likely caused by an explosive event (burn marks were also recorded).</td><td>Reconstruction of trauma-causing forces
</td></tr>
</table>

Lazdėnų mūšio rekonstrukcija: istorinių ir kriminalistinių tyrimų duomenų integracija

Jovita Kadikinaitė-Mickė, Rafał Michliński

Santrauka

Šiame tyrime pristatoma istorinių ir kriminalistinių tyrimų, visų pirma teismo antropologijos ir archeologijos, rezultatų integravimo svarba tiriant istorinius konfliktus. Atliktas atvejo tyrimas, kuriuo siekta ištirti vieno mūšio situaciją ir pritaikyti naujausius teismo antropologijos metodus bei gaires būsimiems tyrimams. Gauti laboratorinių tyrimų rezultatai išanalizuoti ir palyginti su istoriniais šaltiniais bei archeologiniu kontekstu. Tyrimo objektas – Lazdėnų mūšis (1920 m.), vykęs per Lietuvos ir Lenkijos karą (1919–1920).

Iki šio tyrimo Lietuvos ir Lenkijos karas, nepaisant didelio istorinio susidomėjimo, buvo mažai tirtas archeologiniu ir antropologiniu požiūriais – tikėtina, dėl to, kad karių palaikų ekshumacija dažniausiai atliekama artimųjų prašymu, o XX a. pirmoji pusė paprastai yra pernelyg tolimas laikotarpis tokiems tyrimams. Lazdėnų atvejis yra išskirtinis, nes tai vienintelis iki šiol Lietuvoje detaliai ištirtas Lietuvos ir Lenkijos karo epizodas, kompleksiškai ištirtas istoriniais, archeologiniais bei antropologiniais metodais. Šiame kare, ypač 1920 m. antrojoje pusėje, prie demarkacijos linijos vyko nedokumentuoti, chaotiški mūšiai, dažnai kilę savaime, be vadų nurodymo (1, 2 pav.; A priedas). Tokie įvykiai dažnai neatsispindi turimuose to laikotarpio istoriniuose šaltiniuose. Vienas iš panašių mūšių vyko Lazdėnuose, kur 2022 m. archeologai rado 14-os žuvusių karių palaikus. Teismo antropologijos metodais ištirti asmenų biologiniai bei tafonominiai profiliai, apimantys priešmirtinį (*antemortem*), mirties momento (*perimortem*) ir pomirtinį (*postmortem*) laikotarpius, ir detaliai rekonstruotos jų mirties aplinkybės. Analizės duomenys susisteminti siekiant toliau identifikuoti individus ir istoriškai tirti šį mūšį.

Tyrimo rezultatai svarbūs dviem aspektais: 1) nustatytos žuvusiųjų mirties aplinkybės; 2) atlikus antropologinių tyrimų rezultatų, žinomų istorinių šaltinių ir archeologinio konteksto duomenų sintezę, rekonstruota tikėtina mūšio eiga. Tyrimas atskleidė, kad vykdant analogiškus tyrimus labai svarbu palaikyti glaudų specialistų bendradarbiavimą ir neatskirti istorijos, archeologijos bei antropologijos disciplinų. Atskirai paimti kiekvienos jų šaltiniai ir tyrimai dažnai suteikia tik dalinį istorinio įvykio vaizdą ir palieka neatsakytų klausimų. Sutelktos tyrėjų pastangos leidžia išsaugoti svarbias detales ir kuo tiksliau rekonstruoti praeities konfliktų aplinkybes.