

# Alexander the Great's Life-Threatening Thoracic Trauma

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Alexander the Great was a world-class leader with tremendous courage. He paid no heed to the dangers of the battlefield, so he was always in the front lines. However, his excessive courage put his life in danger. Herein, we present an analysis of the information contained in the chronicles about a very severe, life-threatening thoracic trauma that nearly killed the great *stratelates*. The detailed descriptions made by Arrianus allow us to conclude that Alexander the Great experienced a nearly fatal case of tension pneumothorax. Information on how he was managed is also presented.

**Key words:** 1. Pneumothorax  
2. Penetrating thoracic trauma  
3. Alexander the Great

## Introduction

Alexander the Great (356 B.C.–323 B.C.) has been recognized as the greatest *stratelates* (roughly, 'general') in history. His army consisted of 30,000 infantryman and 5,000 cavalrymen. In 334 B.C., when he was 22 years old, he embarked on a campaign starting from the capital of Macedonia, Pella, and he created the Macedonian Empire within 8 years, by 326 B.C. The Macedonian Empire extended from Greece to India and North Africa. Alexander fought in the front lines in every battle, thereby encouraging his fellow warriors to do their best. He was never a spectator in battles, and the rear line was not for him. In each battle, just as any of his soldiers, he faced the risk of not seeing the sunset. He was in danger of "dining in Hades," as they said about soldiers who died during battle. All his soldiers saw Alexander's back in every battle. However, this tactic

appeared to have been nearly fatal, as a life-threatening thoracic trauma occurred during a battle.

## Alexander in the front lines

Alexander was always in the front lines of the army during his campaigns. Consequently, his life was in danger every day. According to his biographer Flavius Arrianus (95 A.D.–176 A.D.), during the battle of the river Granicus "Alexander leaped upon his steed, ordering those about him to follow..." [1], showing that at the time of the attack against the enemy, Alexander remained in the front lines with the other soldiers. Moreover, "...Alexander, who was now approaching. For the king was already near, leading with him the right wing. He made his first assault upon the Persians at the place where the whole mass of their horse and the leaders themselves were posted; and around him a desperate conflict raged..." [2].

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The same biographer also reports that: “But when the armies at length met in conflict, Alexander rode about in every direction to exhort his troops to show their valor…” [3], and that “…Alexander himself and those around him being posted on the right wing, advanced first into the river with a run, in order to alarm the Persians by the rapidity of their onset, and by coming sooner to close conflict to receive little damage from the archers…” [3]. In this way, Alexander encouraged his soldiers and made them absolutely ready to fight and even sacrifice themselves for him, as he fought as their equal. However, this tactic placed him at great risk of injury or even death. If we keep in mind that battles in that era took place in conditions of close physical contact with many warriors using a diverse range of weapons, it becomes clear that it was impossible for Alexander not to be injured or killed.

According to the admiral Nearchus, Alexander became sad when some of his friends told him that his tactic placed his life in extreme danger and that his behavior was that of a soldier, not of a leader. “Nearchus says that some of his friends incurred his displeasure, reproaching him for exposing himself to danger in the front of the army in battle; which they said was the duty of a private soldier, and not that of the general” [4]. However, according to Nearchus, Alexander persisted in this behavior because of his passion for battles and glory, which made it impossible for him to avoid risks during the battle: “…like those who are mastered by any other pleasure, he had not sufficient self-control to keep aloof from danger, through his impetuosity in battle and his passion for glory” [4].

Indeed, Alexander’s biographers describe several traumas that the doctors of the campaign cured. Flavius Arrianus notes that during the battle of the river Granicus, “Rhoesaces rode up to Alexander and hit him on the head with his scimitar, breaking off a piece of his helmet. But the helmet broke the force of the blow…” [1]. Furthermore, Flavius Arrianus states that “he was himself wounded by a bolt from a catapult, right through the shield and breastplate into the shoulder…” [5]. After all, Alexander himself listed his traumas in a speech in order to convince his army to advance beyond the river Indus to the Eastern Ocean, as they then referred to the Indian Ocean. He said, “But someone may say, that while

you endured toil and fatigue, I have acquired these things as your leader, without myself sharing the toil and fatigue. But who is there of you who knows that he has endured greater toil for me than I have for him? Come now! Whoever of you has wounds, let him strip and show them, and I will show mine in turn; for there is no part of my body, in front at any rate, remaining free from wounds, nor is there any kind of weapon used either for close combat or for hurling at the enemy, the traces of which I do not bear on my person. For I have been wounded with the sword in close fight, I have been shot with arrows, and I have been struck with missiles projected from engines of war; and though oftentimes I have been hit with stones and bolts of wood for the sake of your lives, your glory, and your wealth, I am still leading you as conquerors over all the land and sea, all rivers, mountains, and plains” [6]. Nevertheless, Alexander’s only injury described in detail by Flavius Arrianus is a life-threatening thoracic trauma, and we present those details below.

### **The circumstances of Alexander’s trauma**

This severe trauma described by Flavius Arrianus occurred in 326 B.C. during the campaign against the Mallians. The Mallians were an independent Indian tribe who lived between the rivers Acesines and Hydraotes, in a region that nowadays belongs to Pakistan. As Flavius Arrianus reports, “He then took the shield-bearing guards, the bowmen, the Agrianians, Peithon’s brigade of men, who were called foot Companions, all the horse bowmen and half the cavalry Companions, and marched through a tract of country destitute of water against the Mallians, a tribe of the independent Indians” [7]. Alexander conquered the fortified city to which they retreated (the name of which is not reported by any historian) but he also wanted to conquer the acropolis of the town where the rest of their army was encamped. Alexander, being impulsive, believed that few men were in the acropolis, so he grabbed a ladder to mount the wall of the acropolis (“Alexander, thinking that the men who carried the ladders were too slow, snatched one from a man who was carrying it, placed it against the wall, and began to mount it, crouching under his shield…” [8]. Peukestas and Leonnatus also climbed the wall of the acropolis us-

ing the same ladder to help Alexander: "After him mounted Peucestas, the man who carried the sacred shield which Alexander took from the temple of the Trojan Athena and used to keep with him, and have it carried before him in all his battles. After Peucestas, by the same ladder ascended Leonnatus the confidential body-guard" [8]. After this first daring action of Alexander's, a second one followed. Alexander descended into the acropolis, placing his life in extreme danger, as the Mallians attacked him, shooting arrows from everywhere. Flavius Arrianus wrote that "if he leaped down within the fort he might perhaps by this very act strike the Indians with terror, and if he did not, but should only thereby be incurring danger, at any rate he would die not ignobly after performing great deeds of valor worthy of recollection by men of after times. Forming this resolution, he leaped down from the wall into the citadel" [8]. The Indians recognized that he was the leader of the enemy ("...Alexander was conspicuous both by the brightness of his weapons and by his extraordinary display of audacity...") [8], and they did not dare to approach him, but instead attacked all 3 of them with their bows. ("Those who advanced nearer to him he again kept off with his sword; so that the barbarians were no longer willing to approach him, but standing round him cast at him from all sides whatever any one happened to have or could get hold of at the time" [8]). Peucestas, Abreas, and Leonnatus, who were with him, tried to protect Alexander with their bodies. ("Meantime Peucestas and Abreas, the soldier entitled to double pay, and after them Leonnatus, being the only men who happened to have scaled the wall before the ladders were broken, had leaped down and were fighting in front of the king" [9]).

### **Alexander's trauma**

An arrow pierced Alexander's thorax on his left breast. The arrow passed the thoracic wall and injured the lung. Air and blood exited from the wound around the arrow. Flavius Arrianus described how "Alexander himself also was wounded with an arrow under the breast through his breastplate into the chest, so that Ptolemy says air was breathed out from the wound together with the blood" [9]. Evidently, pneumothorax developed, and it was prob-

ably tension pneumothorax because Alexander quickly felt dizziness and fainted, falling unconscious on his shield. Flavius Arrianus's narration is very descriptive: "But although he was faint with exhaustion, he defended himself, as long as his blood was still warm. But the blood streaming out copiously and without ceasing at every expiration of breath, he was seized with a dizziness and swooning, and bending over fell upon his shield" [9].

While the battle continued, "Alexander was now nearly fainting away from loss of blood" [9]. His soldiers then transported Alexander on his shield out of the acropolis without moving the arrow from his thorax. However, it seemed that he might not manage to survive. According to Flavius Arrianus, "Others carried off the king, who was lying in a faint condition, upon his shield; and they could not yet tell whether he was likely to survive" [10].

The head of the arrow had wedged in the chest wall, penetrating the intercostal space in front of Alexander's heart. The arrow could not be easily removed. Moreover, it was feared that his ribs would be broken, causing internal bleeding, if the arrow was removed. Finally, Alexander himself ordered his soldiers to remove first the body of the arrow, and then its head. The arrow was finally removed by brave Alexander's bodyguard, Perdikkas, who was ordered by Alexander himself to rip the wound open with his sword, as the doctors of the campaign were not on the battlefield. Other historians write that the physician Critodemus from Kos removed the arrow from Alexander's chest. Flavius Arrianus writes that "Some authors have stated that Critodemus, a physician of Kos, an Asclepiad by birth made an incision into the injured part and drew the weapon out of the wound. Other authors say that as there was no physician present at the critical moment, Perdikkas, the confidential body-guard, at Alexander's bidding, made an incision with his sword into the wounded part and removed the weapon" [10]. However, all efforts made to remove the arrow caused air and blood to leak from the injured lung. Finally, the arrow was removed in two pieces: its body and its head. Nevertheless, the removal of the head of the arrow resulted in severe hemorrhage and Alexander lost consciousness again: "On its removal there was such a copious effusion of blood that Alexander swooned again; and the effect of the swoon was, that

the effusion of blood was stanchèd” [10].

### Recovery from the trauma

Unfortunately, scant information exists regarding how Alexander recovered from his thoracic trauma. Alexander remained in the camp in order to be treated. Initially, there was a rumor in the army that he had died from his trauma, and all the soldiers became desperate and despondent. They wondered who would become their new leader and safely lead them back to Greece. Flavius Arrianus reports that “While Alexander was remaining in this place until his wound was cured, the first news which reached the camp from which he had set out to attack the Mallians was that he had died of the wound; and at first there arose a sound of lamentation from the entire army, as one man handed the rumor on to another. When they ceased their lamentation, they became spiritless, and felt perplexed as to the man who was to become the leader of the army” [11]. They believed that everything was difficult, if not impossible, without Alexander (“all things appeared to them uncertain and impracticable now that they were bereft of Alexander”) [11]. Alexander’s wound was so severe that he could not emerge from his tent.

The established belief that the Macedonians’ leader was dead led Alexander to write letters to his army, but no one believed that the letters were written by him. According to Flavius Arrianus, “But when at length the news came that he was still alive, they with difficulty acquiesced in it; and did not yet believe that he was likely to survive. Even when a letter came from the king, saying that he was coming down to the camp in a short time, this did not appear to most of them worthy of credit, on account of their excessive fear; for they conjectured that the letter was concocted by his confidential body-guards and generals” [11]. Unfortunately, the historians provide us with no information about how Alexander recovered from his thoracic trauma.

Finally, when he had fully recovered, he was presented to the Greek army on a ship for everyone to see that he was alive. According to Flavius Arrianus, “When Alexander became acquainted with this, for fear some attempt at a revolution might be made in the army, he had himself conveyed, as soon as it

could be done with safety, to the bank of the river Hydraotes, and placed in a boat to sail down the river” [4], and “when the ship bearing the king approached the camp, he ordered the tent covering to be removed from the stern, that he might be visible to all” [4]. In order to convince everyone that he was alive, he ordered that his tent should be carried at the stern of the ship, where it would be visible to everyone. He greeted them, and then his army responded with cheers, thanks to the gods, and even tears. Flavius Arrianus writes that “until at length he stretched out his hand to the multitude, when the ship was nearing the bank. Then the men raised a cheer, lifting their hands, some towards the sky and others to the king himself. Many even shed involuntary tears at the unexpected sight” [4]. Alexander requested a horse to ride in order to encourage his army. When this happened, his army started to cheer loudly: “but he ordered them to fetch his horse. When he was seen again mounting his horse, the whole army re-echoed with loud clapping of hands, so that the banks of the river and the groves near them reverberated with the sound” [4]. Then, he permitted his soldiers to approach and greet him. “On approaching his tent he dismounted from his horse, so that he might be seen walking. Then the men came near, some on one side, others on the other, some touching his hands, others his knees, others only his clothes. Some only came close to get a sight of him, and went away having chanted his praise, while others threw garlands upon him, or the flowers which the country of India supplied at that season of the year” [4]. Nothing else is mentioned regarding Alexander’s injury.

### Comments

The aforementioned trauma was the most severe trauma experienced by Alexander, as described by historians. Its location was the left side of the thoracic cavity, at chest height. The arrow entered the third or fourth intercostal space. Thanks to the shape of the head of the arrow, if the superior and the inferior rib remained untouched, the arrow could not enter deep into the thoracic cavity. Fortunately, only Alexander’s lung was injured. If his heart had been injured by the arrow, death would have been unavoidable. Instead, the upper lobe of the left lung

was injured, resulting in air and blood leak, as described by historians: "Ptolemy says air was breathed out from the wound together with the blood" [9]. The air and blood leak was described as massive ("But the blood streaming out copiously and without ceasing at every expiration of breath" [9]), so we can infer that the lung trauma was very severe. If we keep in mind that Alexander became dizzy and lost consciousness very quickly after his injury, we can suppose that tension pneumothorax occurred. Tension pneumothorax causes a drop in arterial blood pressure and consequently unconsciousness. When Alexander fell onto the ground and remained immobilized, the air leak was reduced and the exit of the air entrapped in the hemithorax was facilitated, enabling him to return to consciousness. Alexander then recovered from his injury, as described above. Unfortunately, there are no medical data on this recovery. However, it is certain that the air and blood leak would have continued for a long time.

Unfortunately, whereas battles are described in detail by historians, Alexander's wounds and other medical problems that occurred during the campaign are hardly described at all. This is surprising since an official historian accompanied Alexander on his campaign. Thus, we can conclude that what is described as happening during the campaign corresponds to real events. Indeed, Alexander was accompanied by an official historian, Callisthenes, who was the nephew of Alexander's teacher, Aristotle. This historian refused to prostrate to Alexander, who had adopted this Persian habit. As a result, he was initially prisoned and then hanged [12].

The army was also supported by doctors during the campaign. The well-known doctors were Critodemus from Kos, who probably removed the arrow from Alexander's thorax, and Philip the Acarnanian. Consequently, that group of physicians probably had the responsibility of recording medical events, although Alexander's later death and his descendants' disputes may have led to the disappearance of written records. Another possible explanation for the absence of data on Alexander's injuries is that Alexander wanted to emphasize the glorious aspects of this military campaign, rather than aspects of his personal life. Alexander himself was so tough and reckless that he did not care about his personal injuries, and likewise he did not want his fellow war-

riors to care about their injuries. According to Flavius Arrianus, "The next day, Alexander, though suffering from a wound which he had received in the thigh from a sword, visited the wounded, and having collected the bodies of the slain, he gave them a splendid burial with all his forces most brilliantly marshalled in order of battle" [13]. Additionally, Homer uses only a few, simple words to describe injuries in the "Iliad", considering them to be insignificant details of a battle. Alexander always kept the "Iliad" under his pillow for inspiration during his military campaigns [14].

## Conclusion

In conclusion, Flavius Arrianus describes a case of severe, life-threatening trauma experienced by Alexander the Great. Alexander's excessive courage and lack of fear exposed him to major risks. However, Alexander survived that trauma. If we find Alexander's body somewhere in Alexandria in Egypt in the future, we will be able to confirm that this life-threatening injury took place. Until then, our only evidence is the descriptions in the "Anabasis of Alexander" written by Flavius Arrianus.

## Conflict of interest

No potential conflict of interest relevant to this article was reported.

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