

## Historical Vignette: Andreas Vesalius and Head Injuries in Royalty

### Introduction

Andreas Vesalius (1514–1564), the author of “*De Humani Corporis Fabrica Libri Septum*” is considered to be the father of modern anatomy.<sup>[1,2]</sup> By dissecting human bodies himself, he challenged several traditional Galenic misconceptions<sup>[1,2]</sup> and after a stint at teaching in the University of Padua became imperial physician to the court of King Charles V and later his successor Philip II of Spain.<sup>[2]</sup>

We describe two cases of head injuries in the royal families of France and Spain in the 16<sup>th</sup> century (where he was involved in treatment) which are both instructive and of historical interest.

### Case 1: Henri the Second, King of France

Henri II (1519–1559), the French king, had arranged for a jousting tournament to celebrate two marriages – part of a treaty he had signed to end the war with Spain and Italy. On June 30, 1559, he was injured as the wooden lance of his opponent splintered against his armor and fragments made their way up below an improperly fastened visor and entered his right eye.<sup>[3]</sup> Though he lost consciousness immediately, he regained it shortly, forgave his opponent and was even able to walk back to his bedroom with support.<sup>[3]</sup> The larger splinters were removed from his eyes but the smaller ones were left in place. Among the doctors attending to him was the famous surgeon Ambroise Paré. The following morning, he was conscious but over time had worsening headaches and also began to have episodes of confusion (interspersed with periods of lucidity in which he attended to his royal duties) in which his vision “came and went.” Meanwhile, Vesalius was called on to attend to the king and reached Paris on July 03.<sup>[4]</sup> A very peculiar clinical examination was conducted by him – the king was made to clench a white cloth between his teeth and it was pulled abruptly away causing him a great deal of pain. Following this Vesalius opined that the king would not survive. Norwich<sup>[4]</sup> opines that this was an “extreme method of eliciting the head flexion sign.” While the two doctors opined that there was no skull fracture (which caused much relief to the royal household-the prevailing notion being that the brain could not be injured in the absence of injury to the skull), they suspected he had a contrecoup contusion.<sup>[3]</sup> Trepanation was considered but unfortunately was deemed that it would not be of much use.<sup>[3,4]</sup> and over time the king’s headaches worsened, he had focal seizures and eventually his respiration worsened and he died on July 10, 1559.

After his death, an autopsy was performed that revealed contrecoup contusions in the occipital lobe with liquefactive

necrosis with blackish discoloration of the meninges overlying it and the whole of the left hemisphere “covered with a yellowish ichor like fluid”<sup>[4]</sup> – in all probability an acute subdural hematoma that was becoming chronic.

### Case 2: Don Carlos, Heir apparent to the throne of Spain, son of King Philip the Second

Carlos, Prince of Asturias (1545–1568), also called Don Carlos was the son of King Philip the Second of Spain (through his first wife) and was heir apparent to the throne of Spain. On April 19, 1562, while chasing a young maid he fell down the stairs<sup>[3]</sup> and suffered a head injury with a scalp laceration that exposed his pericranium.<sup>[5]</sup> He was put on bed rest and initially, bloodletting was considered but not done in view of profuse diaphoresis. By the 4<sup>th</sup> day, he developed high fever, severe headaches, and had painful and enlarged neck nodes.<sup>[5]</sup> On the 11<sup>th</sup> day after injury, clinicians reached a diagnosis of “a pericranial or skull infection with retained fragments and purulent material.” While some surgeons advocated skull curetting the majority of physicians advocated conservative treatment. Finally, King Philip II sent for Vesalius and on May 01 the wound was cleaned. However, over the next few days, the prince developed profuse subcutaneous collection and remained febrile and delirious, and complained of numbness in his left leg. Vesalius deemed that the main damage was intracranial and advocated trepanation<sup>[3]</sup> to reach the “brain clothing” (meninges). This was done on May 21, with curetting of the bone till the margins of the site bled.<sup>[5]</sup> No skull fracture was found but osteitis and empyema were diagnosed. After repeated explorations, on June 02 a sequestrum delivered itself after which his condition improved rapidly and he was cured by June 13, 1562.<sup>[5]</sup>

### Discussion

With hindsight and a better understanding of the pathology of head trauma, though it seems obvious to us today that Henri II had brain contusion with an acute subdural hematoma while Don Carlos had pyogenic osteomyelitis and possibly an empyema, these two cases had great historical significance. Kean<sup>[3]</sup> states pithily “the treatment of royals often defined what became the standard of care for everyone else.” These cases involving Vesalius, put to rest the notion of the skull needing to be fractured to cause brain injury and the existence of contrecoup contusions was firmly established. The triad of fever, headaches, and neurodeficits pointing to an empyema was beginning to be realized and the fact that trepanation and curetting dead bone could salvage a patient from life-threatening calvarial infection was recognized. Last but not the least, Henri II

was the first celebrated case to undergo an autopsy (the technique of the same had already been laid out by Vesalius in Fabricia) to determine the cause of death and this paved the way for a greater acceptance of such procedures in future.

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### Conflicts of interest

There are no conflicts of interest.

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