G34 Venous Bullet Embolism of a Large Caliber Bullet From the Right External Iliac Vein to the Heart: Case Report and Review of the Literature

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After attending this presentation, attendees will understand the importance of pre-autopsy radiographs in the evaluation of gunshot wounds, become aware of the possibility of large caliber bullets embolizing through the venous system, and become familiar with the literature on venous bullet embolism.

This presentation will impact the forensic community and/or humanity by emphasizing the importance of pre-autopsy radiographs in the evaluation of gunshot wounds, providing the forensic community with a recent literature review on venous bullet embolism, and highlighting the possibility of a large caliber bullet embolizing through the venous system.

This poster will report a case of an unusual venous embolism of a large (.45) caliber bullet from the right external iliac vein to the right ventricle of the heart, and present a literature review of venous bullet embolism to better familiarize the forensic pathologist with this rare entity.

Arterial embolism of a bullet is rare; however, venous embolism is an even more rare occurrence. In both circumstances the bullet is usually a low velocity, small caliber bullet. The literature to date has not reported a case of a .45 caliber venous bullet embolus.

A 30-year-old African-American male was found lying on the floor in a storage room of a convenience store with a gunshot wound to the left lower quadrant of the abdomen. The victim had been standing in front of the store when an unknown suspect approached the victim and began shooting at the victim. The suspect chased the victim into the store and fired additional shots at the victim inside the store. The victim was taken to University of Maryland Shock Trauma and surgery was performed, which revealed a very large hemoperitoneum and retroperitoneal hematoma emanating from the pelvis. Complex vascular injury to the pelvis was repaired, as were the stomach and small bowel, including resection of two portions of the small bowel. The victim arrested on the operating table two hours into the surgery. A preoperative x-ray revealed a large bullet projecting over the right cardiophrenic angle. By report, the victim was supine from the time of the shooting until the autopsy was performed. Autopsy showed a typical gunshot entrance wound on the left side of the front of the abdomen with no soot or gunpowder stippling on the skin surrounding the wound. The bullet traveled front to back, left to right and downward, injuring the stomach, multiple loops of small bowel, the confluence of the left common and external iliac veins and arteries, the bifurcationof the aorta, and the right external iliac vein just proximal to its bifurcation. A minimally deformed, .45 caliber, copper-jacketed bullet was recovered from the right ventricle of the heart.

Bullet embolization should be suspected when there is an entrance wound and no exit wound and the bullet cannot be located in the suspected region after following its path either by visual or x-ray examination. The pattern of bullet embolization depends on body position during and subsequent to the injur; gravity; muscular and respiratory movements; the missile's size, weight and shape; the diameter of the vessel lumen; blood flow; and the blood volume status at the time of injury. Venous bullet emboli usually end up in the right side of the heart or the pulmonary arteries, with the origin most commonly being the vena cavae or iliac veins. The literature has documented 76 cases of venous bullet embolism from 1834 to present. The vast majority of literature describing venous bullet emboli has been surgical, and therefore items of forensic importance, such as the caliber of the bullet, tend not to be reported. The largest review of 53 cases of venous bullet embolism did not report the calibers of any of the bullets. Of those cases reviewed, the largest caliber bullet found that resulted in a venous embolism was a .38 caliber.

This case emphasizes the importance of pre-autopsy radiographs in the evaluation of gunshot wounds, and points out that one cannot exclude the possibility of a venous bullet embolus simply because of the use of a large caliber bullet.

Venous, Bullet, Embolism

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