



## Physical Anthropology Section – 2005

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### H28 Modern Day Cranial Trepanation: The Ventriculosotomy

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Attendees will become familiar with the recognition of a cranial surgical procedure that may be unfamiliar to the forensic anthropologist.

This presentation will impact the forensic community and/or humanity by better informing forensic anthropologists of the variety of surgical procedures that may affect the human skeleton.

This case study involves a 32-year-old Mexican man whose remains were recovered in a remote desert location in southwestern Arizona. The remains were discovered by law enforcement personnel who were patrolling an area known for illegal immigration into the United States. A presumptive identification was obtained via personal effects recovered with the decedent. The remains were partially skeletonized with extensive areas of mummification of the skin and desiccation of the tissues within the thoracoabdominal and cranial cavities. Of concern to the forensic pathologist was an apparent fracture of the left ala of the thyroid cartilage. A forensic anthropology consultation was requested to address the possible traumata and issues relating to identification.

Results of the forensic anthropology examination revealed that the decedent was likely a Hispanic male who was 28 to 38 years old. One tooth had residual restorative material present, but lacked the complete restoration. The remains were estimated to have a postmortem interval of between one and six months. Healed fractures were present to the left maxilla, the mental eminence of the mandible, and the thyroid cartilage. All of these fractures could have been produced by a single traumatic event.

The most remarkable characteristic revealed during the forensic anthropology examination was a circular defect to the right aspect of frontal squamous. This defect had been transected by an autopsy saw during the craniotomy. The external beveling of this defect suggests that the cranium had been trephined. Present within the external bevel was fibrous and fatty tissue. This defect was discussed with the forensic pathologist who opined that it was likely the result of the surgical placement of a subarachnoid screw for the monitoring of intracranial pressure.

Further history was obtained and revealed that the decedent had been involved in a motor-vehicle accident ten years earlier. The decedent had been the operator of a motor vehicle that struck a utility pole at a high rate of speed. He sustained facial fractures as well as a significant closed-head injury that required emergent ventriculostomy for intracranial pressure monitoring. No neck injuries were documented but evaluation was only clinical beyond radiographs of the cervical spine to rule out fracture. After ten days the ventriculostomy catheter was discontinued and the decedent was transferred to a rehabilitation facility from which he was eventually discharged.

Closed head injury frequently produces elevations in intracranial pressure (ICP) which requires treatment to prevent deleterious, possibly fatal, sequelae. As clinical examination is unreliable in assessment of ICP, various invasive methods for direct measurement have been developed. In general, these invasive methods employ a burr-hole drilled into the posterior right frontal bone (assuming right hand dominance) for access to the cranial cavity for pressure transducing monitors. This site corresponds to the location where the defect was located in the decedent's cranium. Duration of monitoring is usually on the order of days and no further treatment follows the removal of the monitor except closure of the scalp defect and local wound care.

**Ventriculostomy, Intracranial Screw, Trepanation**