

Increased Intra Cranial Pressure and Head Trauma

Received : December 01, 2021; **Accepted :** December 20, 2021; **Published :** December 29, 2021

The onset of increased intracranial pressure is often attributed to many pathologies such as large artery acute ischemic stroke, intracranial neoplasms, or disorders such as meningitis. The most common reason for which the onset of intracranial pressure is observed is due to traumatic brain injuries, such as colliding one's head into a hard object as a result of an accident. By definition, an intracranial pressure that exceeds 20 mm Hg is considered high and indicative for the need of immediate treatment. Through the advancement of medicine and technology, the variety of treatment options available to relieve patients of increased intracranial pressure has grown tremendously. In practice today, there exists a multitude of treatment options ranging from nonsurgical interventions to surgical interventions. Traumatic brain injury (TBI) is composed of an external mechanical force, whether it be a change in acceleration or impact by projectile that causes a temporary or at times a permanent brain function impairment as well as physical damage to the human brain anatomy. It is important that we establish a clear understanding of the term TBI and its partnering term non-TBI. A traumatic brain injury is brought on by the impact generated by an external force, while a nontraumatic brain injury is brought on by internal forces such as a stroke or infection.

A traumatic brain injury, which we have now learned arises from external forces, can come in two pathological forms: penetrating and nonpenetrating. This classification presents as simply as it is defined. A penetrating TBI results in several lesions starting from one's head down to the cerebral level, and these often occur in severe accidents or injuries. A clear and prime example of a penetrating TBI is one that occurs all too often to members of our military, a foreign projectile being discharged from an external high-force machine, which then strikes a human head. A nonpenetrating TBI is the form that we will cover more in depth within this chapter and results from an external force acting upon the head, but it does not penetrate any layer of human anatomy. Within the clinic, the formal classification of TBIs may be reduced to open-head injury for patients presenting with traumatic brain injuries of the penetrating type, and for patients presenting with a traumatic brain injury of the non-penetrating type, the term closed head-injury may be assigned. To aid in our

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Citation: Leith (2021) Increased Intra Cranial
Pressure and Head Trauma. Med Case Rep Vol.7
No.12.218

understanding of traumatic brain injuries and later on the rise of intracranial pressure, it is imperative we touch upon the anatomy of the human brain such that successive sections of this chapter can be understood with a greater degree of clarity. The human brain, the core of the central nervous system, controls a vast majority of bodily processes and functions. The center of knowledge and core processing is perhaps the most important regulator of human life, yet only weighs between three to five pounds. The first line of defense for the brain is called the cranium, often referred to as the skull, and this shields the brain with a tough bone structure. The brain covering itself contains three layers: the dura, arachnoid and pia. Interestingly enough, there also exists a space between the pia and arachnoid referred to as the subarachnoid complex. This area houses a vast network of veins, arteries, and nerves, which channels both blood and electrochemical potential to the heart and back to the brain. This subarachnoid complex is prone to trauma as well as constriction or full blockage. Any trauma that may cause constriction or blockage will also pose a greater threat to the tissue of the brain.

Acknowledgement

None

Conflict of Interest

None