

"DOCTOR AT SEA" a monthly Column in The Islander Magazine

Head injury

As I write this piece in early November, the most expensive election campaign in history is drawing to a close and, by the time you read this, we will all know who has become head of the executive power of the US Government. The head of Government is a critical function and is protected by layers of security which have become increasingly necessary as the two contestants have moved up the ranks to become the Candidates. This serves as a not so subtle introduction to a few thoughts on the brain as the head of executive function in the human body and the skull as one important layer of security to protect this vital organ.

The brain is inside the strong bony armour of the skull and is surrounded by membranes which serve as additional defences against infection and also contain a fluid (cerebrospinal fluid, CSF) which helps to float the brain inside the skull and thereby dampen the effect of sudden movements.

Serious head injury can produce a range of symptoms and signs but it is helpful to resolve this wide range into three main component injuries, namely, skull fracture, bleeding inside the skull, and concussion.

A fracture of the skull may produce a soft depression at the point of impact but, even in the absence of such an unequivocal finding, a break in the skull produces a track to allow fluid such as blood or CSF to find its way into abnormal destinations such as a discharge from an ear or nostril or bleeding into the white of the eye or bruising around the eyes or behind the ears. The breach in defences puts the casualty at risk of infection and antibiotic injection is an important first aid measure at sea. Oral treatment is not recommended when there is a risk of unconsciousness and possible vomiting and then inhalation of vomit in reduced consciousness. From the time of the head injury, it is necessary to monitor the vital signs (pulse rate, blood pressure, temperature, breathing rate, pupil responses, level of consciousness) to be alert to incipient deterioration and also to provide valuable information to the medical services.

Traumatic bleeding inside the skull accumulates over a few hours or maybe days and forms a collection of blood at the point of bleeding on whichever side of the brain is affected and this results in one-sided signs in the rest of the body, in particular, the pupils may become unequal. The skull is a tight compartment and the only place for expansion is the opening at the base through which the brain stem and spinal cord pass. As bleeding progresses, the brain is compressed at the base and this leads to nausea and vomiting, changes in respiration, drowsiness, decreased consciousness and death. Clearly this is a life-threatening situation and hospital treatment involves drilling burr holes of bone from the skull to relieve the compression. There are some situations where no amount of first aid training is much help in the middle of the ocean and this must be one of them although we still get students keen to have-a-go as a last resort! Tele-medicine is on the increase in the yachting industry and particularly as prices drop with equipment under development for the mass market. This will give on-shore doctors real-time audio and visual information on the state of a casualty but decompression of intracranial bleeding is pushing the boat out rather far and evacuation to shore remains the best option.

Concussion is a more diffuse phenomenon produced by the rapid to and fro movement of the brain against the inside of the skull when subject to a firm blow to the head. This can produce brief unconsciousness, loss of memory for the event and events for a while afterwards and a generally dazed feeling. The associated headache can persist for several weeks but gradually settles and the memory can also recover working backwards to the time of the injury. Anyone in a safety-critical job needs to be off-duty for 24 or 48 hours and anyone who has concussion and then has lowered consciousness a few hours later must be treated as a potential bleed inside the skull as well as concussion. Teasing out the three major underlying injuries in head injury helps to understand the various associated signs but in real-life they can all co-exist in a complicated injury.

This ground is covered in Medical First Aid Courses and the training ensures that someone onboard has an idea of the issues. Some of the injuries may sound distasteful or gruesome but they make a lot of sense given some idea of the cause and effect relationship between injury and outcome. Protection of the brain ensures safe continuing function of executive power within the human body and having some understanding increases the chance of survival if we ever have a friend or colleague in need.

Finally, let me wish you a happy Christmas as we celebrate the birth of the Head of all.

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