

LETTERS TO EDITOR

A comparison of anesthesiology modules between developed and developing countries; What is the role of journals

To the Editor:

Anesthesiology as a specialty has improved and established itself significantly during the previous few decades. These rapid changes have made a prominent gap in between anesthesia practice in the developed and developing countries. Anesthesiology journals undoubtedly have tremendous impact on transferring the current of knowledge between specialists. In some countries, by tradition, anesthesia is considered merely a technical exercise, and anesthesiologists are not well respected as doctors. In other countries such as United States (US) anesthesia is very highly respected, and anesthesiologists are considered highly skilled physicians. Here we tapped in to the roots of differences between anesthesiology in Iran and US, and the impact of anesthesiology journals in filling these gaps. Due to similarity of structure in medical health and education system, same board exam textbooks such as 'Miller's Anesthesiology' etc., we have selected Iran and US for framing this comparison.

Anesthesiology has actually improved its position by several slots to stand among top 5 residency programs in US. On the other hand, it came in the last 4 places in the selection of medical students for residency in Iran. There are several reasons why Iranian students rank anesthesiology at the bottom of their selection category. First and foremost, there is a gap within equipment and facilities between Iran and US. For instance in US, many techniques are implemented under sonographic guidance inside operating rooms or ICU's; using Trans Esophageal Echocardiography (TEE) is a routine procedure undertaken in operating rooms (OR) by anesthesiologists.¹ However, in Iran many complicated procedures are carried out blindly without sonographic guidance, or TEE; intra-aortic balloon pump (IABP), and extracorporeal membrane oxygenation (ECMO) are usually carried out by cardiologists.

Administrative attitude toward anesthesiology and the scope of privileges of anesthesiologist inside and outside OR's is also a point of dissimilarity.² One example of this distinction is typically seen in cardiac surgeries where a cardiologist is invited to take part in operating room in Iran. Regarding anesthesiology residents, in US under emergency situations only a board certified anesthesiologist is allowed to induce

anesthesia, whereas in Iran senior residents could individually induce anesthesia, which could improve their self-esteem and skills.^{3,4}

Anesthesiologists have ranked very high in terms of salaries and payment in US according to a survey published by CNN.⁵ Essentially, it is the anesthesiologist who prepares and rides the patient through the operation safely, and high salaries and good training have helped to drop the failure rates of anesthesiologists significantly in US. On the other hand, anesthesiologists in Iran are getting better paid only in private sector, although in Iran, same California book is used for billing and coding assessments as in US.

American Medical Association (AMA) has assigned five board certificates to Anesthesiology, including Critical Care Medicine (CCM), Sleep, Hospice, Pain, and Pediatrics; AMA fellowships include: cardiovascular anesthesiology, neuroanesthesia, obstetric anesthesiology, perioperative echocardiography, vascular anesthesiology, thoracic anesthesiology, and regional anesthesiology. In Iran, there are no board certifications and only fellowships of CCM, pain, cardiac anesthesia, and neuroanesthesia are offered. CCM has been established in Iran since 2006 and currently only 10% of the CCM spots are filled with internists and 90% are anesthesiologists unlike in US. There is also a tough resistance to CCM fellows to continue their job in OR's, rather they are expected to work only in an ICU.

Anesthesiology journals usually have a mission to advance the highest standards of practice of anesthesiology among anesthesiologists all around the world. These journals are in the focus of attention of the anesthesiologists in Iran as well as in scientific community all around. This explains why journals should have been more concerned to address these gaps and differences by publishing papers in this regards. In fact, while anesthesiologists in countries like Iran may still be leery of amalgamating new advances into their practice, they are eager to participate in learning from high level researches published in such journals. In conclusion, anesthesiology is on the brink of change in developing countries and anesthesia journals have a key role in providing an appropriate ground in this regard

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Impact of aging of the materials used in a ventriculoperitoneal shunt on its function: A Case Report and review of literature

Dear Editor,

Cerebrospinal fluid (CSF) shunting is one of the most commonly performed neurosurgical operations. For individuals without normal CSF drainage, CSF shunting allows for the egress of fluid out of the head. Thus CSF shunting protects the patient from a life-threatening build up of intracranial pressure by diverting CSF to an alternative location (e.g., the peritoneal cavity) through a synthetic tube. Identifying patients with shunt malfunction and obtaining prompt neurosurgical consultation for shunt revision is an important task for emergency physicians. Neuroimaging is typically obtained to help in identifying patients with shunt malfunction. Imaging usually includes a shunt series (SS) and a CT scan of the head. An SS is a set of plain radiographs of the entire course of the shunt tubing (e.g., skull, chest and abdominal radiographs). Possible causes of shunt malfunction, such as tube disconnection, fracture, calcification or migration of the tip from the intended end point may be identified on the SS. If shunt malfunction is present, an expected finding on CT scan of the head is absolute or relative ventriculomegaly.¹

The true impact of aging of materials on shunt function is probably underestimated.² Complications associated with these devices have various origins. Among late complications, fracture or migration of the system is related to the subcutaneous adhesion of the distal

tubing in a growing child along with calcification and blockage.^{1,3} Recently we came across a 12-year-old girl, who had undergone a ventriculoperitoneal (VP) shunt insertion, because of congenital hydrocephalus, at 3 years of age. She arrived in the outpatient department with complaints of persistent unremitting headaches. On Examining the patient, the shunt system was not functioning .Shunt revision was planned .Per operatively the ventricular end was washed but the reservoir could not be freed of the debris , similarly the abdominal end patency was checked but it was found to be blocked too, hence both ends were exteriorized .The abdominal end was very hard to exteriorize due to thick fibrous attachments with the tubing however after the removal of the distil end it was found that the abdominal end passing over the clavicle and chest had hardened and was not compressible digitally or with plain forceps. The shunt apparatus, which contained obvious deposition easily seen with a naked eye (reservoir and tubing) (Figure 1) was sent for, chemical salt analysis. Chemical salt analysis revealed that the mineral deposits consisted of phosphate crystals. Operative findings showed that the most extensive deposits were present in the part of the tubing transversing above the clavicle and chest, where the catheters were subject to heavy mechanical stress.

After removal and reinsertion of a new shunt system, her headache disappeared.



Figure 1: ventriculoperitoneal shunt reservoir and tubing

After the introduction of silastic ventricular shunt tubing in 1957, it has proved to be a stable material producing minimal soft-tissue reaction. Longer-term

experience has shown, however, that implanted silastic tubing is not always totally inert. Variations in the quantity of silica and vulcanizing agent added to medical-grade silicone rubber may provoke a soft-tissue reaction. Static electrical charges on the tubing may hold dust and lint. Benzalkonium chloride may be absorbed into the silicone rubber and may reenter the body after implantation. Detergents and dissolved ethylene oxide gas may excite soft-tissue fibrosis. In addition, polymers are known to undergo biodegradation as a result of hydration, splitting of covalent bonds, and dissolution and digestion by macrophages. Although microscopic calcification of the tissues surrounding silastic shunt tubes seems to be common, calcification heavy enough to be apparent on plain radiographs is rare. Such calcification seems to indicate degeneration and tethering of the shunt catheter and should prompt a search for disconnection.⁴

It appears that the continuous flow of CSF through shunt valves causes surface deposits of sodium chloride and other crystals on all aspects of the valve, including the outlet pathways. The formation of deposits may be encouraged by the adhesive properties of the materials that constitute the valve parts.⁵

Although most shunt complications can be addressed by better patient management and surgical technique, late complications appear to be partly related to aging of the material. Distal tubing calcifications have been observed in barium-impregnated catheters. The industry recently responded to these observations by introducing plain

silicone-coated shunt tubing.³ Fracture of the catheter is related to calcification and tethering, which dispose tubing to fracture.⁶

This signifies that we should keep the possibility of this entity in our mind while treating the children with shunt malfunction.

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