



Something to ponder

Giving Our Practice Another Look

Have you ever noticed that many anesthesia practitioners perpetuate ideas and practices that are based on poorly or partially understood concepts. Take for example the practice of aspirating cerebral spinal fluid (csf) before, during and after the injection of a spinal anesthetic. I have yet to ascertain how this dictum came into existence especially when you consider that J. Leonard Corning who is often credited (although erroneously) with being the first to give a spinal anesthetic never mentioned this maneuver in his very detailed description of the procedure (1,2) Perhaps it was because what he actually accomplished was an epidural anesthetic. Nonetheless, sometime between when the first spinal anesthetic was actually given by Augusta Bier in 1885 to now, anesthesia practitioners have been enjoined to aspirate csf upon attachment of the syringe to the spinal needle and at the conclusion of the injection of the spinal anesthetic and some even aspirate for csf mid-injection.

All this aspiration makes little sense especially when you consider that the subarachnoid space is not a homogeneous space; it contains not only csf but spinal nerves, blood vessels and a network of trabeculae - all of which can impinge on the flow of the aspirate. Moreover, it is possible that the arachnoid membrane can collapse upon the pia mater especially in cases of very low csf pressure (3). According to the American Association of Clinical Anatomists as reported by Boon et al (4), "The plunger of a syringe should not be withdrawn if it is attached to the needle or when injecting anesthetic solution. The negative pressure may pull a spinal nerve root against the needle tip and produce paresthesia, pain, or injury." Although practically speaking it makes good sense to check for csf flow after the syringe is attached to the spinal needle (just in case the spinal needle is inadvertently displaced from the subarachnoid space), the current thought is that once the spinal anesthetic is injected the spinal needle is removed without further aspiration of csf (5). And this makes sense, for as our Japanese colleagues have found, the failure rate of spinal anesthesia is not influenced by whether csf is aspirated at the end of injection (6). In fact, for their 310 patients who underwent spinal anesthesia the failure rate was 1.7% for cases in which csf was aspirated and 3.6% for which csf aspiration was not feasible - a difference which the researchers felt was not statistically significant.

The conventional view serves to protect us from the painful job of thinking*.

It has been my experience that during the conduct of a spinal anesthetic some patients may experience paresthesia as the spinal needle penetrates the dura. And in the majority of cases the event occurred when pencil point spinal needles were employed. This may have significance, for as other researchers (7) have acknowledged, the use of pencil point needles produces a greater stretch of the spinal dura than that of the Quincke type; and it is this stretch of the dural receptors that may intensify the perception of paresthesia.

In the past, the occurrence of paresthesia during the insertion of a spinal needle would necessitate clinicians removing and/or redirecting the spinal needle even in the presence of free flowing csf. The rationale for this re-manipulation was based on the teaching that except for the anterior dura mater, the posterior dura was devoid of sinovertebral nerves (7) and thus paresthesia could only occur if the spinal needle had made contact with a spinal nerve within the intervetebral foramen. Yet studies in rats have found that sensory nerves from upper lumbar dorsal root ganglia are prominent in the lumbar peridural membrane and innervate the lower lumbar dura mater directly (8,9) and the rabbit model reveals numerous fine nerve fibers and some small nerve bundles located in both the dura and the longitudinal ligaments (10). And although these are animal studies, from what I can ascertain, at least on a social level, some humans are not that far removed from the rat or rabbit.

Of course I'm not advocating ignoring the signs of paresthesia. In fact, most recently, Pong and associates (11) ascribe paresthesia during the conduct of a spinal anesthetic to the actual contact of the spinal needle with a spinal root, reminding us that this may be more common than we think when you consider that the nerve roots comprising the cauda equina lie tightly within the lumbar subarachnoid space. What I am saying and what Pong and associates have also contended (11) is that in the presence of free flowing csf and a resolving paresthesia, the local anesthetic could probably be safely injected without any adverse sequelae.

*John Kenneth Galbraith(US (Canadian-born) administrator & economist (1908 - 2006)

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