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EDITORIAL

The Cost of Closure

The article by McTaggart et al[1] in this issue of *American Journal of Neuroradiology* nicely highlights the use of arterial closure devices by neuroradiologists. Arterial closure devices are now a $500 million per year industry, with such devices being used in some 30%–40% of femoral artery catheterizations in the United States.[2] The global market for arterial closure devices is estimated to reach an astounding $900 million per year by 2013.[3] The development and marketing of these devices during the past decade has been quite remarkable, and it is worthwhile to pause and consider the propagation of this technology.

If we really lived in a world in which evidence-based medical practice was the norm, the widespread use of these devices would be driven by evidence that patient care is improved by their use. Yet, there is no convincing evidence that shows that these devices are an improvement in care for most patients relative to manual compression.[4] I do not dispute that percutaneous closure devices have a useful application for occasional use, such as in those who require anticoagulation, but the use of percutaneous closure devices at many institutions is beyond just the occasional patient and is becoming the standard for all patients.

So why is manual compression rapidly losing market share to expensive closure devices? Manual compression is typically applied for 15 minutes and is highly effective. While a physician might be able to find a more productive use of 15 minutes, I cannot imagine that it would be difficult to find a capable health care professional who could apply manual compression for 15 minutes. It could be a physician-in-training, a nurse, or another allied health professional. Throughout my career, I have found that it has been easy to identify and use personnel other than myself to apply manual compression following angiography. While there may be institutions that are so strapped for personnel that no one has time for manual compression, I suspect that such institutions would also have associated financial woes that would make generalized use of percutaneous closure devices prohibitively costly.

The financial cost of these devices is significant, typically at about $200 per device, and the reimbursement from third-party payers is essentially nonexistent. Arguments have been made that the cost of the device is compensated by a decreased cost in nursing care because patients can be discharged earlier. I doubt very much that a decrease in nursing care results in substantial financial savings. In fact, I doubt that there is really much decrease in nursing care at all. It has been shown to be quite safe to ambulate patients 2 hours after removal of 6F sheaths[5] and even as little as 1 hour after removal of 5F sheaths[6] when using manual compression for hemostasis. I am not aware of any scientific data that indicate that it is beneficial to use bed rest beyond 2 hours following ordinary transfemoral catheterization. Typical patients who undergo outpatient angiography with a percutaneous closure device will probably not be released until 2 hours after placement of the closure device, so I fail to see a potential savings in nursing costs. Even if you argue for observing outpatients who undergo angiography with a percutaneous closure device for less than 2 hours or for requiring patients who undergo angiography with manual compression to be at bed rest for more than 2 hours, I seriously doubt that the resulting difference in time spent on nursing care would be enough to offset the cost of the closure device. Generally, the nurses we are talking about are at the hospital and are getting paid whether or not they are still watching your patient, so you would need to demonstrate that you were able to reduce total nursing staff to prove that a real financial gain has been achieved by reducing the time spent observing these patients.

What if you just gave the $200 dollars for a closure device to a person to perform manual compression? If you decided that rather than use the closure device, you would instead pay me $200 dollars to do the manual compression for you, with just 8 cases per day, I could make $8000 in a 5-day work week. If I only took 2 weeks of vacation, I could earn $400,000 annual pretax income. That is pretty good money to do minimally skilled manual labor. With significant time between cases for coffee breaks, I would have to seriously consider such a position if it were offered. Another way to think of it is that manual compression is no more difficult than delivering a pizza, and few of us would pay someone $200 to deliver a pizza. Seriously, if you are going to defend the use of closure devices by citing a decreased need for labor, you must consider that $200 can buy a lot of labor.

So why are so many physicians compulsively attracted to expensive arterial closure devices? Is it the time savings that they offer to the physician? I personally see very little time savings. A closure device in a typical case probably takes about 5 minutes of operator time to deploy, and often there is a small amount of bleeding requiring a short period of compression after the device is deployed. So, perhaps 5 or 10 fewer minutes are spent at the patient's side. If someone other than the physician could be doing the manual compression, then the device is actually adding nonreimbursable physician time. Is it the added safety to the patient? There is no reason to believe that there is safety improvement,[4] except perhaps in occasional patients with coagulopathy or requiring anticoagulation. The real reasons that percutaneous closure devices are so widely used may be the following: 1) the simple love of gadgets that is characteristic of most interventionalists, and 2) a disdain of the boredom of the 15 minutes of manual compression (this disdain is exacerbated by remembrances of local legendary cases from the past when manual compression efforts went on for an hour or more). The physician gets to play with an ingenious gadget rather than suffering the boredom and cramped hands associated with manual compression. Aggressive marketing undoubtedly has a role, but I think that the marketing is playing to the physician's natural attraction to the devices rather than generating the attraction.

In the end, individual physicians and institutions must do their own assessment of the proper role of percutaneous closure devices. I can only hope that such assessments are performed rationally.

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