

Vertebroplasty vs kyphoplasty

To the editor:

I would like to comment on your supplement “Vertebral compression fractures in primary care: Recommendations from a consensus panel” (*J Fam Pract* 2005; 54(9):781–788). This is a very useful article to hopefully raise awareness of the new treatments for this painful condition.

While I agree with much of what you say, I am concerned about a few things. First of all, historically the first vertebroplasty was performed over 20 years ago by a French radiologist named Herve Deramond. He was a practicing radiologist. This is important, because as these procedures become more prevalent, there will be more competition for them. Your patients and physicians should know that radiologists have been actively involved in the treatment of these for almost 2 decades.

This is important as well, because the sites you reference for finding a suitable specialist are 2 websites, one of which charges nearly \$900 to register, and both of which are somewhat biased toward surgical physicians. While this alone isn’t necessarily a problem, there’s no mention at all of professional societies like the Society of Interventional Radiology (SIR), which has listed qualified interventional radiologists who provide vertebral augmentation procedures for many years. I do not think you have done yourselves a service by omitting this organization, or the websites of other similar professional societies.

In addition, your article is sponsored by Kyphon, an orthopedic company that markets very aggressively. While their procedure is very enticing, and while I have

performed it, there are some issues you have neglected.

First, kyphoplasty, which by the way is a trade name, is more expensive than vertebroplasty. In some cases, the kit can add thousands of dollars to the cost. Second, at least originally kyphoplasty was done as an inpatient procedure, and with general anesthesia. Some of our local orthopedic surgeons still do them this way. We’ve done them as outpatient procedures with IV conscious sedation. The use of general anesthesia and hospital admission obviously adds considerably to the cost. Next, even in good hands, and by their sales reps’ own admission, kyphoplasty takes longer than vertebroplasty, so there is more radiation exposure to the patient and the physicians and support personnel in the room. Likewise, there is more time under anesthesia.

Finally, and this hasn’t been proven, but I can assure you there is considerable skepticism amongst the interventionalists who perform these procedures, much of the purported vertebral body height restoration may be imaginary. Certainly there are impressive pictures floating around, but no one to my knowledge has done a head-to-head comparison to see whether or not kyphoplasty really does what it says—namely, restore body height with less extravasation and fewer adjacent level fractures. Until that question is answered, and until real questions about cost, radiation exposure, and anesthesia time are objectively evaluated, physicians should exercise some degree of restraint when referring for kyphoplasty. If pain relief is the primary desire, at this time vertebroplasty does the job as well, faster, and cheaper. In addition it may be better to evaluate these results using volumetric CT

or MRI to see whether the central portion of the body is elevated, rather than looking at the endplates only as seen on conventional radiographs.

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The authors respond:

We thank Dr Ullman for his interest in our consensus statement.

Vertebroplasty was first performed in France in 1984 by Galibert, a neurosurgeon in France, for the treatment lumbar and cervical angiomas, not osteoporotic fractures.¹ Use of vertebroplasty for painful osteoporotic compression fractures was developed later and is now the primary use of the procedure in North America.

As stated in our article, balloon kyphoplasty was developed in the late 1990s. The focus of our consensus statement, however, was to promote awareness among family physicians regarding the important consequences of vertebral body compression fractures as well as the availability of these 2 procedures for the treatment of persistent or prominent pain resulting from these fractures.

While it can be difficult to find local providers, the number of physicians performing vertebroplasty and kyphoplasty is growing steadily. To our knowledge, the 2 web sites cited in the article (spine-health.com and spineuniverse.com) do not require registration in order to locate physicians skilled in vertebral augmentation procedures. One site requires a fee for physicians to post their information, a practice we do not think is biasing. The Society for Interventional Radiology's website (sirweb.org) also has an excellent search page that allows search by specialty (http://directory.sirweb.org/eseries/script-content/index_members_search.cfm).

Dr Ullman highlights several distinctions between vertebroplasty and kyphoplasty. While our consensus statement focused on the important consequences of

compression fractures and the availability of treatments, several points should be noted.

First, we would like to clarify that kyphoplasty is a generic term for augmentation of the vertebral body in which sagittal alignment is specifically sought. In Europe, kyphoplasty devices using non-balloon technology are available.

Second, balloon kyphoplasty devices (manufactured by Kyphon Inc, Sunnyvale, Calif) are more expensive than vertebroplasty, as Dr. Ullman notes. Whether long-term costs differ between the 2 procedures is not known. The reader should note that neither balloon kyphoplasty nor vertebroplasty require general anesthesia or an overnight hospital admission. Whereas it is true that balloon kyphoplasty was originally performed as an inpatient procedure under general anesthesia, in the authors' practice (Dr Truumees), most balloon kyphoplasty procedures are performed in an outpatient setting under conscious sedation.

Third, while balloon kyphoplasty may be associated with more radiation exposure and/or longer operative times, it also has more operative goals than does vertebroplasty, namely restoration of spinal alignment. Direct comparisons of operative times and radiation doses have not been published. Articles reporting radiation doses have varied in measurement techniques.²⁻⁷

Fourth, height restoration has been reported in most articles concerning kyphoplasty, and many of the kyphoplasty articles also report restoration of vertebral body angles.⁸⁻¹⁷ In vertebroplasty, some height restoration can be achieved by postural maneuvers (eg, intraoperative back extension), especially among dynamic fractures.¹⁸ On the other hand, kyphoplasty procedures begin with postural reduction, and two studies have shown that postural reduction contributes only a small portion of the final height restored during kyphoplasty.^{19,20}

Dr Ullman points out that volumetric CT or MRI may be better to analyze

whether the central portion of the body is elevated, rather than looking at the endplates only as seen on conventional radiographs. We agree, and improvements in vertebral body volume with both vertebroplasty and kyphoplasty have been noted.^{21,22}

From a biomechanical perspective, height restoration and angular deformity correction may result in a reduced rate of subsequent fractures by reducing anterior stress. To date, 2 controlled but nonrandomized studies have shown a decreased rate of subsequent fracture after balloon kyphoplasty as compared to after nonsurgical management.^{23,24}

However, Dr Ullman is absolutely correct that a head-to-head comparison of vertebroplasty and kyphoplasty has not yet been published. We are aware of some efforts along these lines, including an industry-sponsored study. In the meantime, it seems reasonable that family physicians should refer patients for vertebral body augmentation with vertebroplasty or kyphoplasty according to local practices and levels of expertise.

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