

# Editorial

## The Spine and Its Discontents

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*You may think that it takes remarkable courage to stand up, but there is actually more pressure if you keep sitting.*

Of course my statement could easily refer to the boldness of President A.P.J Kalam to honour the blast victims with two minutes of silence at the Mahim railway station or the determined demonstration by a group of concerned citizens in New York City against the devastating violence in South Lebanon. But to stay consistent with the writings in this space, my statement is directed not at international but at intervertebral pressure as it relates to back pain. In this context the statement reads: "It is not obvious, but when you sit you exert more pressure on your back than when you stand."

History books may disagree, but the great works of the Italian master anatomist Vesalius assure us that all men have a spine. Pre-history books are more objective and agree that the existence of our spine is what in fact defines us. Over 500 million years ago we developed from tiny organisms that lived in water into vertebrates or ones with vertebrae. We began to walk as humans two million years ago as the first hominid, *Homo ergaster*. Our ability to balance upon only two limbs gave us the freedom to use our upper extremities as we wanted. Some use their hands to write for peace. Others shrug their shoulders and bear arms. The spine is certainly the birth of civilization (and its discontents).

A major discontent that falls squarely on the spine is back pain. If neither you nor any of your

friends have had back pain, you need to make more friends. Nearly 80% of us will experience at least one episode in our lives. In 90% of us, the pain will improve without any treatment. Unfortunately it will recur in almost 85% of us. As you can imagine, we are talking big numbers. In the US, back pain puts the economy back approximately \$90 billion in lost productivity and healthcare costs each year. That is nearly the entire GDP of Sri Lanka.

Most patients who experience lower back pain that is caused by a slipped or herniated disc heal naturally without surgery. A disc can be compared to a lychee fruit. It has a tough outside covering (the annulus) and a soft, watery centre (the nucleus). Does the spinal cord run through the centre of the disc where the seed would be? No, the spinal cord is behind the disc, surrounded by the same three tissues that cover the brain. The bony vertebrae are the ones that protect the spinal canal. The discs sit between the vertebrae and give the spine flexibility.

A disc does not truly 'slip' per se. With trauma or degeneration of the lychee (that begins as early as 13), the nucleus pushes on the annulus that can tear and release the contents of the nucleus to nearby nerves. Increasing studies now show that it is not simply the mechanical pressure that a herniated disc places on nerves that causes the sensation of pain. Compressing a normal nerve does not elicit pain. A nerve must be swollen or inflamed for pressure to cause pain. Molecules that escape from the nucleus trigger an inflammatory cascade and irritate the nerves. So a herniated disc is not a simple mechanical problem like misaligned teeth.

The field of pain management is rapidly growing with anaesthesiologists, neuroradiologists and neurologists joining the spinal surgeons to offer their favourite treatments. Steroids are routinely injected into the space around the spinal canal, and give temporary relief of pain on account of their anti-inflammatory effects. Pulsed or continuous current is applied to the disc using radiofrequency to numb the nerves. Precise amounts of oxygen-ozone gas that is injected into the disc both break bonds to resorb the bulging disc, and change the molecular milieu of inflammatory mediators.

While back surgery makes intuitive sense, injecting a gas requires an appreciation of the molecular mechanisms of pain. Clinical data support the science that these alternatives work. So much so that my neurosurgeon father has virtually traded in his scalpel for a needle and electrode!

What can you do to prevent spinal discontent? Swim, lose weight, be happy, stop smoking, and, of course, stand up!

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