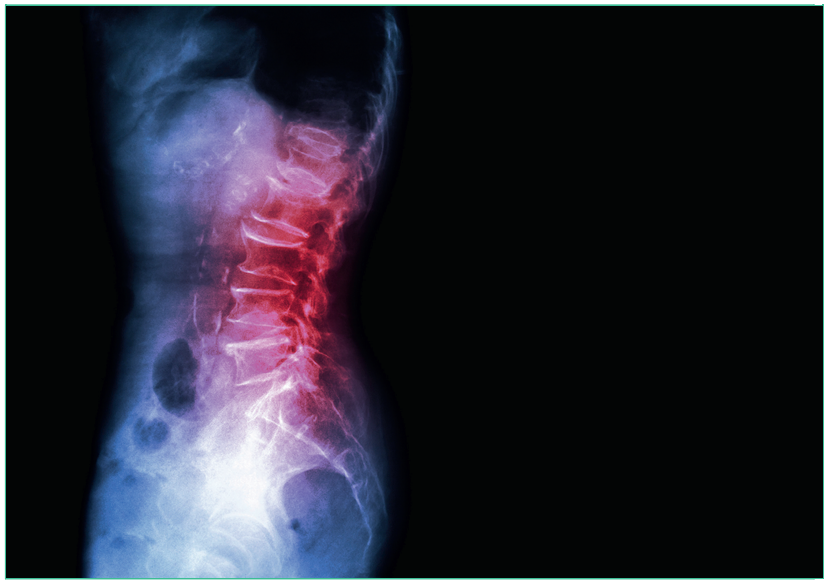
Surgical management of low back pain

Spinal surgery for chronic low back pain is controversial, and the disproportionate number of fusions in private hospitals is unexplained

In developed countries, low back pain is the most common presenting symptom in primary care practice, with a lifetime prevalence of 80% for episodes of back pain.[1] It affects adolescent sportsmen, pregnant women, hospital nurses and middle-aged labourers, and it peaks in the elderly.[1] Back pain disrupts the rhythm of daily life, affecting work, recreation, social life and family income. The level of disability has a significant cost to the community.

There is an encyclopaedic range of medical and alternative treatments for low back pain. Most have, at best, limited benefits.[2] Disappointed patients resort to nerve blocks and ablative rhizotomies which also have limited evidence for long-term benefits.[3]

Armed with mobile phones, consumed with social media, and with rapid access to online information, our patients present with high expectations of modern technology, including surgery. With outstanding results from hip and knee arthroplasties, they expect similar results from spinal surgery. Not uncommonly, the patient attends the surgical consultation with an expectation that the problem scan be fixed.



Aetiology

At the initial consultation, the astute family physician will consider a wide range of diagnoses in the patient with the recent onset of back pain. Renal stones, aortic aneurysm, gastric and pancreatic conditions, malignant metastases, discitis and ankylosing spondylitis will all need to be considered before accepting the diagnosis of non-specific axial low back pain.

Clinical examination in the absence of a radiculopathy is likely to show non-specific signs and is unlikely to identify any specific injury. The supporting muscles, interspinous ligaments, lateral facet joints, vertebrae, discs and sacroiliac joints may all contribute to chronic low back pain, but their individual contribution can be difficult to elucidate clinically.[4]

Today, chronic pain is understood in terms of a biopsychosocial concept, although this can be difficult to explain to a patient. The surgeon John Loeser has untangled this concept with the Loeser rings.[5] He likens the pain injury to the inner core of an onion, with additional layers surrounding it which enhance the experience of pain, including childhood issues, masked depression, substance abuse, pain behaviour and entitlements to secondary gain. For the benefit of the patient and the reputation of the surgeon, these aspects of chronic pain need to be carefully explored before considering spinal surgery.

In the absence of a diagnosis, magnetic resonance imaging of the lumbar spine is required to exclude congenital or advanced pathological changes in patients with low back pain. This tends to open Pandora's Box. Imaging will identify degenerative changes from the third decade onwards, including disc dehydration (the black disc), disc narrowing, lateral facet joint arthropathy and bone spurs. However, there is "very little correlation between imaging findings of disc herniation and the clinical course. Imaging findings of structural change of osteoarthritis do not correlate with pain production".[6] The patient with chronic low back pain, having seen the report of the radiologist and suggestions for further pain interventions, then has renewed expectations of successful treatment.

For patients with non-specific axial back pain, clinical examination and radiological imaging are unreliable guides to surgical or other pain interventions. Because of this dilemma, and faced with anxious patients with high expectations from modern surgical technology, there has been a growing enthusiasm for surgical fusions.

Natural history

The spinal surgeon needs to be conscious of the natural history of low back pain. It is common in adolescence (18–50%), causing disability in up to 9%.[1] There is the

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lifetime prevalence of 80%.[1,7] There is a point prevalence of 37% in the adult population and, although 33% may make a recovery, up to 70% will still complain of pain 12 months later.[7] Back pain can be transient, recurrent and chronic. Psychological, social and environmental issues compound the patient's burden of pain.[5]

Surgery

Spinal fusion surgery for lumbar non-specific low back pain is controversial, particularly because the origin of the pain is undetermined[4] and imaging of the spine is unhelpful.[6] The procedure dates back to 1889 but it is in the past 20 years that there has been a great escalation internationally in its use, with an increase of 267% over 11 years in the United States alone.[8] There has also been a disproportionate increase in the rate of spinal fusions in private hospitals compared with public hospitals, with a 10.8-fold increase in private hospitals. In addition, there is a range of techniques for spinal fusion, including anterior lumbar interbody fusions, posterior lumbar interbody fusions, 360° fusions (anterior and posterior approaches) in one or two stages, and anterior disc arthroplasties. Each of these procedures has different technical complications, and there remains little evidence of better outcomes for one over another.[4,9]

Results

A Cochrane review of surgical fusions for back pain in 1999 concluded that there were no published randomised controlled trials which established effectiveness of fusions for chronic pain.[10] In 2004, a review again concluded that there was insufficient evidence for effectiveness of surgery for a firm conclusion to be drawn.[11] A further Cochrane review in 2005 reported "variable clinical outcomes ranging between 16% and 95%".[9] There was no evident difference, over a period of 2 years, between artificial disc replacement and the less expensive fusion technique. It also found that the techniques using intradiscal thermal coagulation and spinal spacers had lost the support of surgeons and have since been discarded, and that there was insufficient evidence to support spinal fusion for degenerative disc disease, whether for back pain or in conjunction with spinal decompression.[9]

More recently, an Australian study on trends in spinal surgery has noted a significant increase in the rate of fusions, over a 10-year period, of 175%. The rate had increased from 8.4 per 100 000 to 23.1 per 100 000, and 69.9% were instrumented.[12]

The 2005 review by Gibson and Waddell was critical of the outcomes measured, preferring "patient-centred outcomes rather than an assessment of the short-term surgical outcomes."[9] This was to emphasise that reports needed to focus on the patient's perception of pain relief and the patient's return to the previous level of daily activities and employment. It was noted that "The limited evidence of the long-term effects of either surgical decompression or fusion remains a matter of concern given the magnitude of the clinical problem, the numbers and the cost of surgical procedures being performed".[9]

A later study of a cohort of patients receiving workers' compensation in New South Wales concluded that the outcomes were so poor that spinal fusions were not recommended for this group.[12] In addition, independent reviews noted that the incidence of persistent post-operative pain syndrome was as high as 40% and that there was a 50% success rate, at best, from the first operation, 30% from the second and 15% from the third.[7]

Conclusions

The current high incidence of chronic low back pain in developed countries has little to do with biomedical explanations and is best understood in terms of a biopsychosocial framework, including work dissatisfaction, secondary gain and a cultural bias toward symptom relief. In Western medicine, current approaches to this problem, including the overuse of expensive diagnostic imaging, have failed and have in fact exacerbated the problem, because of the misunderstanding of the aetiology of the condition. The well documented ageing of our population and our increasingly sedentary lives are enhancing the epidemic of chronic low back pain. Our patients are presenting with high expectations of modern medicine and, in many cases, there are additional entitlements to monetary gains from workplace injury and third-party incidents. Multiple procedures have been carried out for spinal fusions, particularly in the past 20 years, but the surgery remains controversial with respect to aetiology and indication. There has been a lack of patient-oriented surgical outcomes, and there is a lack of outcomes for most things that we do for chronic low back pain.

In conclusion, there is a growing tendency for the astute spinal surgeon to have all patients assessed independently and, at times, for them to attend an interdisciplinary pain program to clarify issues of psychological origin that might complicate recovery. While the spinal fusion procedure remains controversial, it would be valuable for spinal surgeons to undertake a national audit of patient-centred outcomes for the procedure, similar to the excellent audit carried out for hip and knee arthroplasties by the Australian orthopaedic surgeons.

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