Decompression of the lumbar spine for spinal stenosis is a gratifying procedure, improving the quality of life for many otherwise fit elderly and middle-aged patients who are prematurely disabled. There is much debate as to whether or not fusion of the decompressed segments should be part of the surgical procedure. Failure to fuse may leave a patient with good legs but intractable back pain. Fusion is a much more debilitating procedure than decompression, carrying its own risk of complications in those patients who are likely to have all the conditions associated with advanced years. Vitaz et al noted that 10% of patients over the age of 75 years who had surgery for spinal stenosis suffered one or more serious postoperative complications.

There is little guidance from the literature. The conclusions of the few papers on the subject are evenly divided between the three obvious options: never fuse; always fuse; fuse sometimes. One is therefore left to develop a personal view on the subject, preferably based on experience, sometimes bitter, or to adopt the views of others. Intuitively, in a world of few absolutes, the most appropriate approach is likely to be one which recommends fusion sometimes. All that remains is to establish a set of indications which satisfies the demands of one's own practice.

Advising against fusion, Silvers, Lewis and Asch reviewed 244 patients retrospectively. The authors had performed laminectomy without fusion and concluded that postoperative ‘instability’ was rare. Brunon et al conducted a review of the literature and considered that spinal fusion was a technique of unproven benefit for the treatment of degenerative spinal stenosis. Niggemeyer, Strauss and Schulitz carried out a meta-analysis of 30 articles reporting 1668 cases. They noted that decompression was the surgical procedure with the highest rate of success with the fewest complications, and that decompression and fusion without instrumentation was the least successful.

More recently, Iguchi et al have described 37 patients treated by laminectomy alone and followed for a minimum of ten years. More than half had an excellent or good result. Grob, Humke and Dvorak conducted a randomised, controlled trial on 45 patients and decided that, in the absence of obvious segmental instability, fusion was not required for decompressive surgery.

However, Nasca, reviewing 114 patients, found that those who had concomitant decompression and arthrodesis had a better outcome than those who had decompression only, especially in the presence of degenerative spondylolisthesis or scoliosis. Yone et al described their experience of 34 patients, 17 of whom had radiological ‘instability’. The best results were in those with unstable spines in whom fusion had been added to decompression, and the worst in those with decompression alone.

Clearly, fusion is beneficial in certain circumstances. Sonntag and Marciano, combining a literature search with their own experience arrived at a set of relative indications for fusion. They suggested that fusion be considered in the presence of degenerative spondylolisthesis, excessive anteroposterior movement with pain demonstrated radiologically, and in mechanical low back pain. Postacchini et al, in a randomised, controlled trial, tested decompression by laminotomy as opposed to laminectomy, and found that postoperative ‘instability’ occurred only in the group having total laminectomy. Johnsson, Willner and Johnsson and Johnsson et al found a statistical association between poor results after operation and subsequent spondylolisthesis. The risk of slip was greater in those who had had spondylolisthesis before surgery than in those who had more radical decompression. Postacchini and Cinotti followed 40 patients for a mean of nearly nine years; 88% showed varying degrees of recurrent stenosis by bone regrowth, which in turn was associated with pre-existing degenerative spondylolisthesis, absence of fusion and poor results. Macnab demonstrated that osteophytes, which can contribute to neural compression, tend to resorb spontaneously once the relevant segment has been successfully fused. It follows that osteophytes excised during decompression surgery will recur eventually in a motion segment which has not been fused. Such recurrence may require years rather than months, but will nevertheless remain a factor in the calculation in favour of fusion in a patient at the younger end of the age range of patients with stenosis.
These observations in the literature suggest a bias towards fusion when indicated. This is usually: when patients suffer mechanical low back pain causing disability equal to that of the stenosis itself; when imaging, especially the plain lateral view in maximum flexion, reveals spondylolisthesis in the segments to be decompressed; after radical decompression; and in those patients under 65 years of age who may have a recurrence of stenosis through bone regrowth.

Most patients who complain of spinal claudication suffer some back pain. It is important to establish the degree of this relative to the claudication. I make it clear to patients that the planned surgery for stenosis will not improve their backache. If they consider that there would be little point in proceeding in such circumstances, I make a tentative offer of fusion, explaining the very different postoperative regime involved and the possibility of significant additional complications during and after surgery. If I receive an enthusiastic request, I advise fusion without hesitation.

Patients with multilevel stenosis are not offered fusion if more than two segments are involved. I have made exceptions on rare occasions, usually when the stenosis is associated with the crippling pain of adult lumbar scoliosis (the ‘tumbledown spine’). Fusion then may extend from T10 to the sacrum, requiring extensive metal scaffolding and allograft but the results so far have been surprisingly successful.

Patients need to be physically and emotionally robust, irrespective of age, to justify this procedure. Patients over 75 years of age or with diabetes, cardiorespiratory inadequacy, or obesity who suffer pain in the lower limbs even at rest are not offered fusion, irrespective of their back pain or spondylolisthesis. They will usually have a hemilaminectomy or total laminectomy in order to minimise the operating time and blood loss.

I now offer fusion in addition to decompression for lumbar spinal stenosis in the presence of one or more of the following: significant low back pain; spondylolisthesis; radical decompression; relative youth and vigour; and fusion required in no more than two segments.

References