

From the Editor's desk

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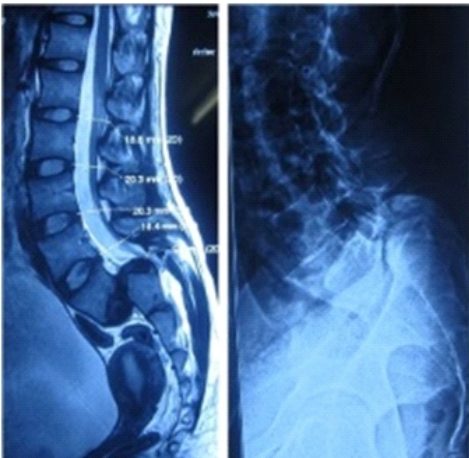
ISSUE - 23

Dear Friends,

Each time we write our thoughts in a new edition of the newsletter, we have tried to bring out the interesting and useful aspects of spine surgery that can make a difference in the management of spinal disorders. Spondylolisthesis is one such domain, where the problem is relatively frequent, but littered with a large number of confounding issues. We hope to refresh the perspective on the approach to a patient with this spinal disorder. We also share our experience of many patients anxiety and reluctance to get a timely surgical intervention in spondylolisthesis, more so in younger patients having high grade dysplastic spondylolisthesis.

Hope you enjoy reading this.

Spondylolisthesis is a slippage of one vertebra over the other, usually most common in the lumbar region. Predominantly seen at the lumbosacral junction i.e. L5-S1 and then at L4-5, this produces symptoms like low back pain, mechanical (i.e. pain produced and exaggerated by activity) and also instability pain (pain exaggerated by movement between vertebrae).



Radiating pain is often the result of the stenosis at the foraminal or central canal regions due to flavum and articular hypertrophy or a dynamic change in the dimensions of the central and foraminal areas due to flexion and extension of the spine. Often these patients get better by leaning on to a support when in pain, thus bending their spines and increasing the canal dimensions and in effect giving more space for the nerve roots.

Many patients having spondylolisthesis are asymptomatic or have minimum occasional symptoms of low back pain not affecting the functional activity. The listhesis is often picked up as incidental finding.

Treatment strategies for spondylolisthesis are dependent on a lot of factors, primarily pain and neurological deficit. Other factors affecting treatment decisions are age of the patient, type of listhesis and psycho-social issues.

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1. Does every patient with spondylolisthesis require a surgical intervention?
2. If no, then what is the long term natural history of this condition?
3. When will surgery be required for such patients?
4. Whether it's possible to reduce the slipping of the vertebra completely?
5. Is there a danger in reducing a listhesis completely?
6. What happens to the L4-5 disc? Is it necessary to fuse that level too?
7. What is the outcome of the surgery?
8. What are the dangers of the surgery per se?
9. What is the possibility of neurological deficits, left untreated?
10. Is it sufficient to do only a discectomy and decompress the nerve root?
11. What will be the fate of the instability and how will it progress after surgery?
12. How are the outcomes after such surgeries?

Many questions confront a clinician in the decision making with respect to the treatment strategies for spondylolisthesis especially in children and young adults. We shall first discuss the clinical and decision making aspects to address the above questions and then illustrate this with case examples.

Factors influencing treatment decisions in spondylolisthesis:

SYMPTOMS

- Low back pain with radiation to one or both lower limbs
- Limitation of walking distance
- Pain parasthesias and heaviness on walking (neurogenic claudication)
- In the dysplastic /lytic/isthmic type (children), more often radicular and postural with accompanying back pain

SIGNS

- **Hamstring tightness**
- **Nerve root stretch signs**
- **Neurological deficits motor or sensory**
- **Diminished reflexes of ankle or knee**
- **Postural change: Child stands with hips and knees flexed.**

The presence of a neurological deficit, especially a progressive deficit of the either the EHL or the Tibialis anterior coupled with possible cauda equina symptoms definitely makes an absolute indication for surgery.

While symptoms are the key to the decision to intervene in adults with degenerative listhesis, in children and young adults, other factors like cosmesis and progression play a role.

There are clinical instances where a patient presents only with radiating pain and minimal low back pain. MRI shows an intervertebral disc prolapse with correlating dermatomal radiating pain. Dynamic radiographs unmask a spondylolisthesis which would have been otherwise missed, thus requiring a fusion and decompression. It is worthwhile to insist on dynamic radiographs (flexion-extension views) in all patients with disc prolapse and some back pain.

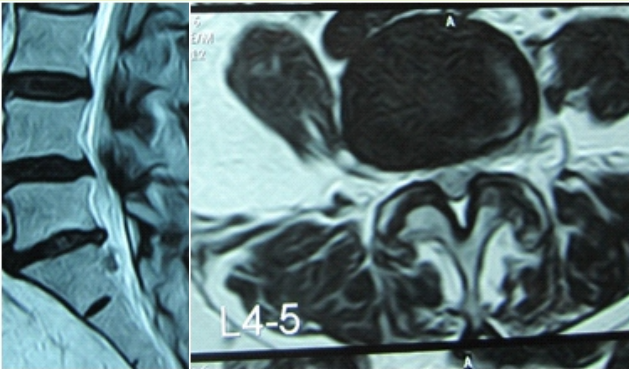
So, surgical treatment of a patient with listhesis is indicated in patients having disabling symptoms and/or neurological deficits. We tend to advise surgery for kids with dysplastic listhesis where the probability of slip progression is higher and also in kids more than grade 2 listhesis even in the absence of symptoms/signs.

Role of conservative treatment:

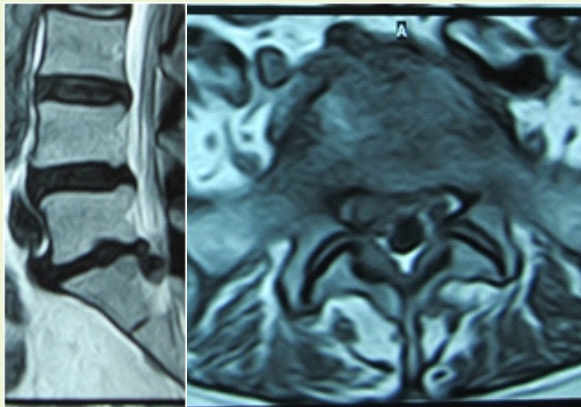
Many a patient with spondylolisthesis is asymptomatic or has occasional low back pain (without radiation into the lower limbs). In these situations when the functional limitation due to the spinal disorder is low, patients can be managed with lifestyle modification, physical therapy with emphasis on back and core strengthening. Surgery can be offered if any increase in symptoms or functional limitation is seen.

Case Examples:

Case 1:



She was a 45 year old lady having Grade-I L4-5 spondylolisthesis who was managed conservatively at our centre. She was counselled about progressive claudication and back pain if the listhesis progresses and the necessity for surgery in the event of disabling pain or leg weakness. The patient came to us with sudden increase in back pain and leg pains with inability to walk even few steps. On examination her SLRT was restricted to 20 deg and she had weakness in plantar flexion. The patient had come prepared for the spondylolisthesis surgery as she was counselled previously



On fresh MR imaging we did not find any significant stenosis or compression at the L4-5 spondylolisthesis level, but the patient had an acute disc herniation at L5-S1 level significantly compressing the S1 root. She underwent a microdiscectomy at L5-S1 level and is able to carry out all her daily activities.

Case-2:

- A 58 year old man was treated conservatively for L5-S1 spondylolisthesis and was referred to our centre for surgery as the conservative treatment had failed to give any relief.
- The patient had come prepared for surgery to our centre. He had progressive low back ache for the past one year with the Lower limb pain worsening since 3months making it difficult for him to walk even at home.
- On examination, the patient had waddling gait, with no neurological deficits. Surprisingly he did not complain of any significant radicular pain. The patient complained of severe and constant pain in Groin and trochanters with diffuse bony tenderness over the pelvic bones.
- Due to the discrepancy in the clinical pain presentation with associated bony tenderness, superimposition of some metabolic bone disease was suspected.
- A pelvis x-ray revealed severe osteopenia with looser's zones and he was diagnosed to have Hyperparathyroidism on blood reports. He was treated for hyperparathyroidism and has not come back to us for spondylolisthesis surgery!

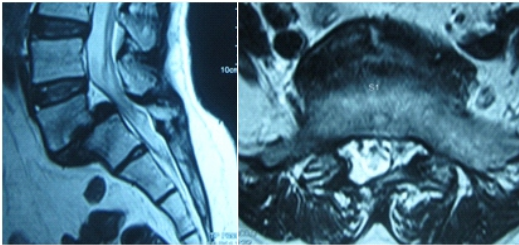


Fig 3: The MRI shows a grade-II spondylolisthesis at L5-S1.

Fig 4: Pelvis radiograph showing looser zones and severe osteopenia.



Misconceptions and fears:

On the contrary to the above examples, we also see patients who clearly require surgery for spondylolisthesis, but refuse or postpone surgery due to the feared complications of surgery. Most patients even today enquire us about "how many months" bed rest is required after surgery and will "I become paraplegic" after the surgery.

Case 3:

She was a 68 year old female with 3-4y of progressive claudication; since 2-3 months unable to walk to toilet and had developed partial foot drop, bilaterally since a month. She had postponed the surgery due to the feared complication of paraplegia with spine surgery. She was counselled appropriately and the relatively small 1% risk of neurological deterioration was explained. She was suffering with multilevel spondylolisthesis with instability and severe stenosis from L2 to S1.



She underwent surgery with Multilevel decompression and stabilization of the spine from L2 to S1 with reduction of listhesis. She recovered well with no perioperative complications and was able to walk the second day of surgery. She has been on our follow-up and has regained 3/5 power in her ankles and is able to walk about 2-3 km.

Technical Considerations of spondylolisthesis surgery:

Spondylolisthesis surgery - A Spine Surgeon's passion!!

Surgical reduction of a severe spondylolisthesis giving the patient a near normal spinal alignment with prevention of its progression is one of the challenging surgeries the field of spine surgery. Achieving a good surgical reduction in a severe grade of spondylolisthesis and seeing the patient walk the same day of surgery is highly gratifying for any spine surgeon! We do believe in complete reduction and fusion of spondylolisthesis and present two severe cases of below.



This was a adolescent girl with spondyloptosis – meaning the L5 body has completely slipped anterior to S1 body which makes surgical reduction and fusion that much more challenging. The key to safe reduction and fusion in such cases, in our experience, is to have good lateral release of the L5 exiting roots with sacral dome osteotomy and thorough discectomy prior to attempting reduction. The radiological and functional outcome of this patient was gratifying to us as spine surgeons.

She was a 23y year old dentist who underwent a similar procedure after having postponed the surgery in her teenage due to fear of neurological complications. We have shown this case particularly to highlight the fact that we need not use the interbody cage in all cases of spondylolisthesis as has been the practice, generally. In this example you can appreciate that the L5 body is trapezoid in shape and a rectangular cage introduced in the L5-S1 space would have pushed the L5 body anteriorly, endangering the reduction achieved with the screws.

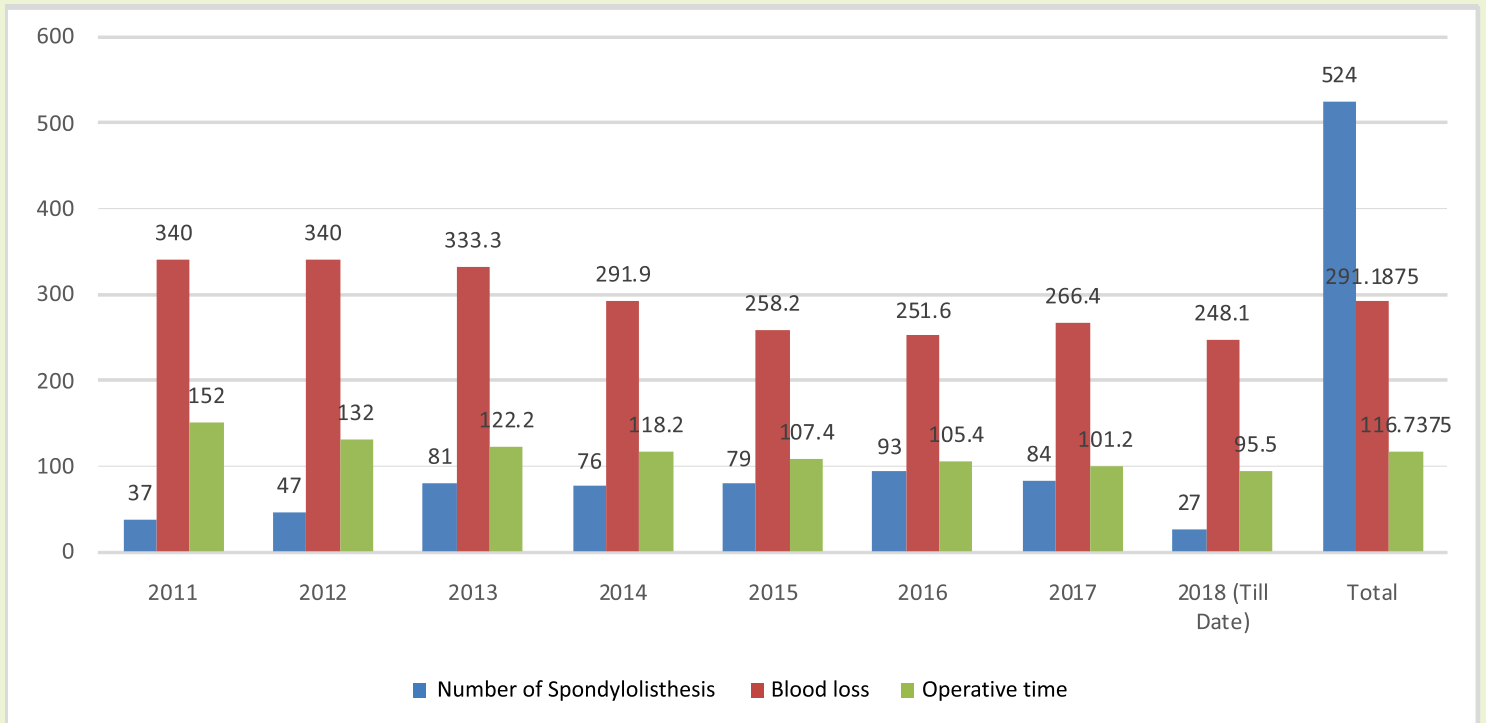
- Spondylolisthesis surgery today is safe to the extent of 98 to 99% with 1-2 % risk of surgical site infections and less than 0.5% incidence of postoperative neurological deficits.
- The surgery typically takes about 60-90mins for a single level spondylolisthesis and 120-180mins for a multilevel spondylolisthesis. All of our patients are made to walk the evening of surgery and are discharged on 3rd postoperative day.
- We counsel all our patients about the outcomes realistically, with about 70-80% decrease in back pain and morning stiffness, 90% relief of radicular and claudication pains with progressively increasing walking distance, at about 2-3 months postoperatively.
- Shorter the operative time, faster and better is the recovery.

Minimalizing blood loss is a very important factor. Decompression and fusion of the listhesis in elderly is a proposition with inherent dangers solely on account of the co morbid medical conditions like diabetes, hypertension, IHD, Cerebrovascular disease, bronchial asthma etc. However a good and thorough clinical work up by a physician and anaesthetist coupled with optimisation of the medical conditions with end to end care reduces the perioperative morbidity risk to a great extent.

Expectation management with thorough counselling on the nature of the spinal disorder, need for treatment and options of treatment , with a focus on the postoperative course and outcome helps in eliminating the misconceptions and fears in a patient in our out-patient.

In our experience at Vitus Spine, we have operated the following number of various types of spondylolisthesis at our centres and present the results below.

| Year | Number of Spondylolisthesis | Blood loss | Operative time |
|----------------|-----------------------------|------------|----------------|
| 2011 | 37 | 34C | 152 |
| 2012 | 47 | 4C | 132 |
| 2013 | 81 | 333.3 | 122.2 |
| 2014 | 76 | 291.9 | 118.2 |
| 2015 | 79 | 258.2 | 107.4 |
| 2016 | 93 | 251.6 | 105.4 |
| 2017 | 84 | 266.4 | 101.2 |
| 2018(Till Dae) | 27 | 248.1 | 95.5 |
| Total | 524 | 291.1875 | 116.7375 |



Our experience in treating spondylolisthesis only adds more conviction to the well-established fact that spondylolisthesis is a spinal disorder that requires surgery which can be safe effective and has consistently reproducible good outcomes.

The Scoliosis Project

Scoliosis and kyphosis are spinal deformities which cause lateral or forward curvature of the spine. They can be a result of congenital anomalies of vertebral body segmentation or growth. Most commonly they are idiopathic and present in the adolescent age group. Commonly seen in girls, these often cause complications if left untreated.

Though the incidence of spinal deformities is rare, the prompt diagnosis and treatment of the deformity not only prevents its complications but also restores the individual to his/her productive best.

Problems with untreated scoliosis/kyphosis:

- Deformity progression
- Pulmonary insufficiency
- Neurological problems due to cord compression/stretch
- Cosmetic issues – ill-fitting dresses.
- Pain and decreased height.

Deformity correction surgery is done on patients who have progression of deformity or any of the complications as described above. Many of the patients from low socioeconomic strata neglect this treatment as it is expensive and out of their financial reach. Scoliosis surgery is expensive due to the cost of the implants used and the infrastructure required to make this surgery a safe procedure. They then present to the doctor at a stage when the complications mentioned above appear.

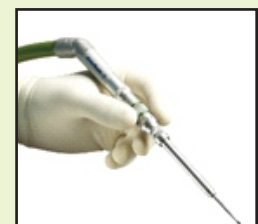
The Scoliosis project is helping children from these underprivileged sections to get these surgeries with suitable financial aid. The patients and family are interviewed to determine the extent to which they require financial aid and the financial status of the family is assessed. Depending on their financial condition, financial help is extended so that the patient's family doesn't make any unwanted/ burdening debts. This prevents the family from going in to bad debts. So far, 60 patients have been operated under this project. There has been an enthusiastic response even from the donor groups to contribute to this cause.

We are aware that there is a significant number of patients in the community who require early and prompt diagnosis, suitable counselling and referral to a tertiary care centre and also appropriate financial aid to undergo this treatment. The key to this whole process rests in the prompt diagnosis part, where the consulting clinician can play a crucial part.



Scope of surgery

Equipment for safety of surgery



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