Correction of Spondylolisthesis in Adolescents using a Monosegmental, Circumferential Reduction and Fusion.

ABSTRACT:

Background Data:
Traditional surgical treatment for moderate to severe grade spondylolisthesis in adolescents has included instrumentation and fusion from L4 to the sacrum. The L4/5 level is included to improve mechanics of reduction and fixation. The purpose of this study was to assess the efficacy of monosegmental circumferential fusion at L5/S1 only for spondylolisthesis using a combined approach in improving percent slip and slip angle, as well as generating a solid fusion.

Methods:
A retrospective review of a consecutive series of eight patients with grade three or greater L5/S1 spondylolisthesis were treated by a single surgeon at a single institution between July 2003 and November 2008. Six female and two male patients were included with a mean age of 15 years and 10 months.

The procedure included a transperitoneal approach through a Pfannenstiel incision, a L5/S1 disectomy and interbody fusion utilizing a lordotic titanium cage and BMP2, and a posterior approach for placement of pedicle screws and iliac crest bone graft at L5/S1.

Throughout the follow-up period, patients were questioned about presence of pain, appearance concerns, and sexual dysfunction. Radiographic parameters reviewed included changes in percent slip, slip angle, pelvic incidence, and presence of fusion.

Results:
At latest follow-up, all patients remained pain free. Solid fusion was evident by 6 months in all patients. Percent slip and slip angle improved in all patients (33-33%). Pelvic incidence was above normal in all patients before surgery, and showed no significant change postoperatively. There were no complications including those associated with the use of BMP2 (cage subsidence, retrograde ejaculation in males.)

Conclusions:
Monosegmental circumferential fusion of the olisthetic level using a combined anterior-posterior approach using pedicle screws, a lordotic cage and bone graft/BMP2 is an effective treatment of spondylolisthesis in adolescents. Fusion of a healthy L4/L5 segment can be avoided.

Level of Evidence:
Level IV Case Series