ORIGINAL STUDY

Spinopelvic Balance Restoration using Posterior Vertebral Column Resection in Fixed Lumbosacral Deformity Following Pyogenic Spondylodiscitis

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Abstract

Background data: **Several articles reported on posterior vertebral column resection (PVCR) for correction of thoracolumbar deformities that followed tuberculous spondylodiscitis, but fewer focused on fixed lumbosacral deformity secondary to L5 pathology.**

Study design: **A retrospective cohort study was performed.**

Purpose: **This article aimed to determine the degree of spinopelvic parameters correction after PVCR of the fifth lumbar vertebra (L5) in lumbosacral deformities secondary to pyogenic spondylodiscitis and define its relation to patients' clinical and functional outcomes.**

Patients and methods: **This retrospective study included 12 patients with kyphotic lumbopelvic spinal deformity secondary to healed pyogenic spondylodiscitis at the lumbosacral junction. The study included seven (58.3%) males and five (41.7%) females with a mean age of 37.5 ± 7.61 years. Patients were treated with PVCR. Plain radiography, computed tomography, and MRI were performed on all patients, and the following parameters were measured using the Surgimap (version: 2.2.13) computer program: lumbar lordosis (LL), pelvic incidence (PI), pelvic tilt (PT), sacral slope (SS), and focal deformity angle. Bony fusion is assessed using postoperative radiograph and/or computed tomography. Visual analog scale for both leg and back pain and the Oswestry Disability Index were assessed preoperatively and at the last follow-up.**

Results: **The follow-up period lasted for 16 months (12−18). The solid union was achieved in all patients in 8.17 ± 1.52 months with no major postoperative complications. The mean kyphotic deformity was significantly corrected to −5.69 ± 6.77° (P < 0.001). LL significantly increased to 47.89 ± 3.37° (P < 0.001). PT decreased significantly to 17.88 ± 4.132°, and SS increased to 41.13 ± 4.01°. The PI-LL mismatch was corrected to 11.1 ± 4.2° in the final follow-up (P < 0.001). Oswestry Disability Index improved to 22.50 ± 3.20 postoperatively (P < 0.001).**

Conclusion: **PVCR provides significant correction of pelvic parameters and clinical functions of patients with fixed lumbosacral deformities secondary to pyogenic spondylodiscitis (2022ESJ260).**

Keywords: L5 vertebrectomy, Lumbosacral spine, Posterior vertebral column resection, Pyogenic spondylodiscitis, Spinopelvic deformity

Introduction

Adult spinal deformity has many challenges for spine surgeons, especially with severe and rigid sagittal malalignment [1]. In kyphotic angular deformity of the lumbosacral junction, some sequences of compensatory mechanisms develop to keep the patient in the upright position. These mechanisms include flattening of the lumbar lordosis with a subsequent decrease in the thoracic

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kyphosis. Pelvic retroversion occurs in various degrees, depending on the mobility of the sacrum and hip joints [2]. When all these measures fail, the trunk is translated forward (positive sagittal balance); such postures are functionally and psychologically disabling. This is more obvious in lumbosacral deformities where lack of sacral mobility caudal to the deformity leads to early proximal truncal shift and decompensation [3]. These deformities are considered fixed when it does not correct with dynamic (flexion and extension) standing views. Usually, it leads to several degrees of disability (functional impairment and/or neurological deficit). Pain is not an uncommon symptom in later years [2,4].

Legaye et al. [5] proposed pelvic incidence as a fundamental anatomic parameter, which is specific and constant for everyone and is a strong determinant of pelvic orientation and lumbar lordosis. The arithmetic sums of sacral slope (SS) and pelvic tilt (PT) are two position-dependent variables used to describe pelvic orientation in the sagittal plane. Changes occur in PT and SS, as in lumbosacral deformities, contributing to alteration of the normal pelvic orientation and lumbar lordosis.

In such cases, spinal osteotomies must be performed to achieve a stable, balanced spine in both the sagittal and coronal planes [6]. Vertebral column resection (VCR) is considered the spinal osteotomy that provides tremendous degrees of correction to the deformities but with various degrees of risk [7]. The VCR technique involves the complete resection of one or more vertebral segments and can be performed using either combined anterior and posterior approaches or a posterior-only approach. VCR enables translation of the spinal column and offers the advantage of controlled manipulation of both the anterior and posterior columns with active reconstruction [8].

Recently, the use of posterior vertebral column resection (PVCR) has increased. Therefore, we aim to determine the degree of spinopelvic parameters correction after PVCR of L5 in severe lumbosacral deformities secondary to pyogenic spondylodiscitis and define its relation to patients' clinical and functional outcomes. We assume the importance of our research, as several articles reported on PVCR for correction of thoracolumbar deformities that followed tuberculous spondylodiscitis, but fewer focused on lumbosacral deformity secondary to L5 pathology.

Patients and methods

This study was approved by the Zagazig University institutional review board ethical committee (ZU-IRB# 6234-29-6-2020).

This retrospective study included 12 patients who experienced kyphotic lumbopelvic spinal deformity secondary to healed pyogenic spondylodiscitis of the lumbosacral junction. Those patients were operated on in the Orthopedic Surgery Department at Zagazig University Hospitals, from the beginning of 2014 till June 2020.

All patients experienced previous pyogenic spondylodiscitis involving the lumbosacral junction. Patients included seven (58.3%) males and five (41.7%) females, with a mean age of 37.5 ± 7.61 years (24–48). Most of the patients did not give a history of any medical comorbidities, except for two, where one experienced diabetes and hypertension, whereas the other gave a history of bronchial asthma. Four patients had preoperative L5 and/or S1 radiculopathy.

Patients were treated with PVCR, and they were selected according to the following inclusion criteria: adult patients (age >18 years) with lumbosacral deformities, that is, lumbosacral kyphotic deformity associated with leg and back pain with abnormal spinopelvic parameters. We excluded patients presenting with lumbosacral deformities in association with active infections or tumors.

Visual analog scale (VAS) scores for both leg and back pain were assessed preoperatively and at the last follow-up, with 0 indicating no pain and 10 maximum pain. Functional outcome was measured using the Oswestry Disability Index (ODI).

Plain radiograph (anteroposterior, lateral, and lateral dynamic views), computed tomography (CT), and MRI were performed for all of our patients, and the following parameters were measured using the Surgimap (version: 2.2.13) computer program: lumbar lordosis (LL), pelvic incidence (PI), pelvic tilt (PT), sacral slope (SS), and local deformity angle. We referred to lumbar lordosis in minus (−) and lumbar kyphosis in positive (+). Bony fusion is assessed using postoperative radiograph and/or CT. These patients had a follow-up period ranging from 12 to 18 months (median of 16 months).

Operative technique

Transcranial electrical stimulation motor-evoked potential for intraoperative neuromonitoring for all patients. All patients had general anesthesia with endotracheal intubation. A Foley catheter was applied to monitor fluid balance intraoperatively. All patients were placed in a prone position. After sterilization and draping, a straight posterior midline incision was done. Following subperiosteal dissection, the vertebrae between the uppermost and the lowest instrumented vertebrae were exposed to the tips of the transverse processes. Pedicle screws were inserted using the free hand technique starting from L3 pedicle to pelvic fixation, which was accomplished using S2 alar-iliac screws, and a temporary rod was applied to one side, allowing vertebral resection with stability.

Resection of the vertebral column

To maximize the effect of the resection, it was done at the apex of the deformity. The posterior elements were resected, including the laminae cephalad to the pedicles above and pedicles below the resection. This usually resulted in 5–6-cm exposure of the posterior column, allowing access to the spinal canal to avoid dural buckling or impingement. The corresponding nerve roots (L4 and L5) had been preserved.

Meticulous subperiosteal dissection was deepened following the lateral wall of the vertebral body until the anterior surface of the vertebral body was freely palpated. Under visual control, the pedicles and the lateral portion of the vertebral body were removed with a small osteotome. The vertebral body and the intervening discs were removed in a piecemeal fashion gradually toward the medial side and over to the other half of the vertebral body through the void created in the vertebral body, keeping a thin shell of bony posterior vertebral wall beneath the dural tube. The anterior walls were also removed in a piecemeal fashion, with the soft tissue tube anterior to the vertebral bodies left intact.

Meticulous subperiosteal dissection was performed while avoiding injury to segmental vessels. When an adequate amount of vertebral body is removed, all the posterior vertebral wall visible lateral to the dural tube could be removed with an Epstein reverse cutting curette and pituitary forceps.

Following the resection of the posterior wall on the working side, another temporary rod, contoured to the shape of the deformity, was inserted into the working side and securely locked to the screws. Then, the rod on the other side was removed to allow resection. The same procedure was carried out on the opposite side. After completing the resection, the rod that had been removed was replaced and connected to the screws on both sides. This is followed by the final check that the canal is clear of any residual compression at the resection margins and redundant bony or disc tissue attached to the anterior side of the dura that might hinder the free and untethered movement of the dural tube. Different reduction techniques were used to correct the deformity, including in situ rod bending, exchanging temporary rods with those precontoured to the desired (corrected) shape one by one, and extension of the operating table.

The dural tube and the nerve roots were assessed under direct vision, and probing each time, a correction maneuver was completed to ensure that there is no compression. After final correction, fluoroscopy and neuromonitoring were checked for transcranial motor-evoked potentials and somatosensory potentials from the lower extremities. For anterior fusion at the resected area, titanium mesh (Harms cage) filled with autogenous cancellous bone chips graft was used (from local bone and posterior iliac crest). Circumferential fusion across the resection gap and posterior fusion was carried out at all instrumented levels. One or two closed suction drains were placed at the resection site, another one was placed at the posterior iliac graft site, and the surgical wound closed in layers. Patient-controlled pain medication pump is used for pain control. A postoperative lumbosacral brace was used to help with soft tissue healing and support for about one month (Figs. 1 and 2).

Results

This retrospective study included 12 patients who experienced kyphotic lumbopelvic deformity secondary to pyogenic spondylodiscitis of the lumbosacral junction. The mean hospital stay for these patients was 5.25 ± 0.96 days. The intraoperative parameters were as follows: estimated blood loss was 666.67 ± 97.26 ml (520–870 ml), operative time was 224.17 ± 32.25 min (180–270 min), and blood transfusion 2.17 ± 0.57 U (1.00–3.00 U). No major postoperative complications were recorded, except for two patients: one of them experienced postoperative ileus and the other had postoperative superficial wound infection treated with antibiotics and repeated dressing. These patients had a follow-up period ranging from 12 to 18 months (median 16 months), and the solid union was achieved in all patients in 8.17 ± 1.52 months.

The mean kyphotic deformity of the lumbosacral junction preoperatively was 18.46 ± 6.07°, which was significantly corrected to −5.69 ± 6.77° ($t = 48.395$, $P < 0.001$), with a correction rate of about 24.15 ± 1.72°. This correction in the local kyphotic deformity improved lumbar lordosis significantly (19.5 ± 3.31° increased to 47.89 ± 3.37°) ($t = 20.369$, $P < 0.001$). This was also reflected in the significant changes in pelvic parameters PT and SS, where PT decreased significantly from 39.31 ± 1.85° to 17.88 ± 4.132° and SS increased from 19.69 ± 2.72° to 41.13 ± 4.01°. The PI-LL mismatch was corrected in these patients; its mean decreased from 39.5 ± 3.95

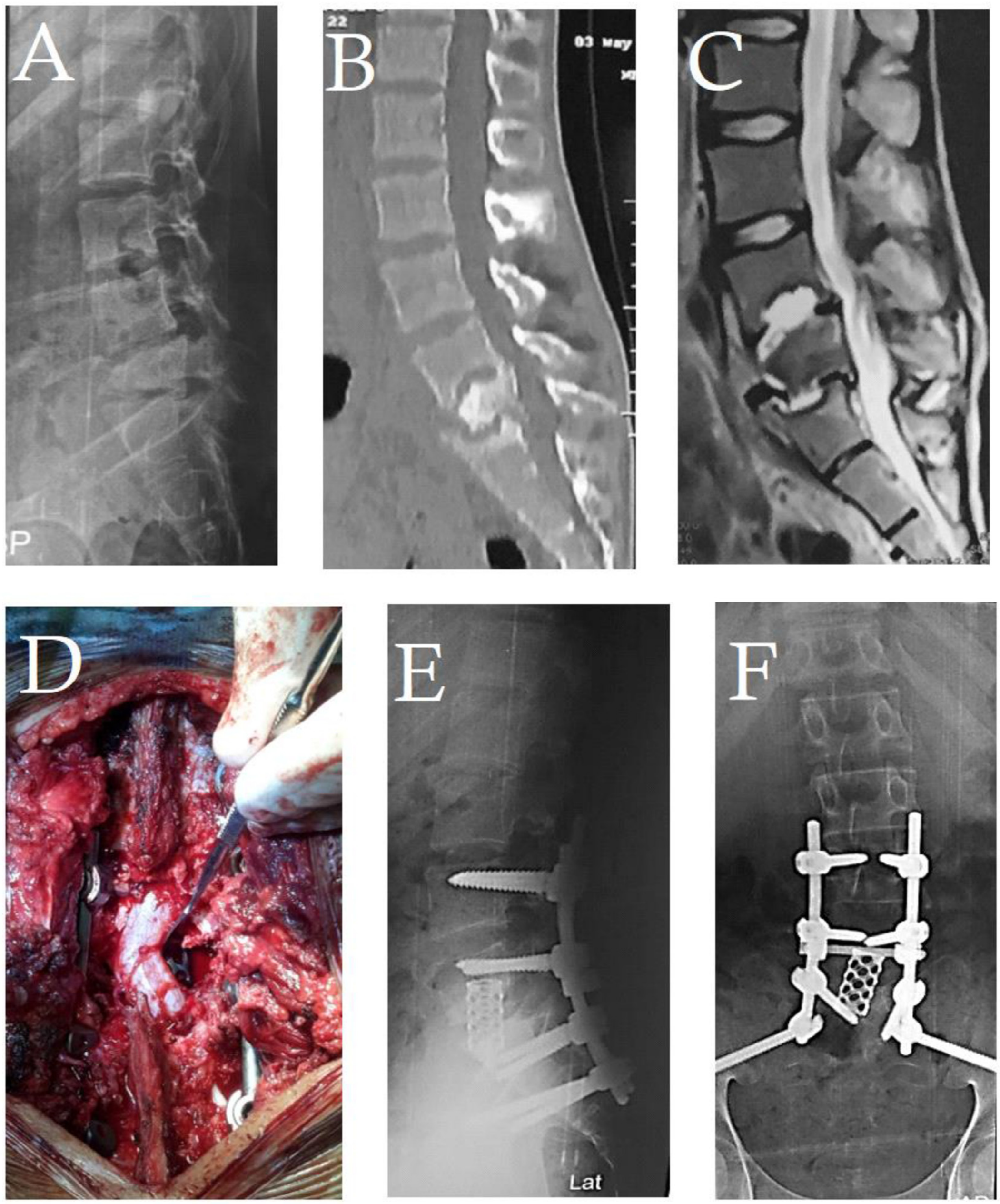

Fig. 1. (a) Preoperative lateral radiograph, (b) computed tomography (CT), and (c) MRI showing postinfection L5 deformed vertebra with no signs of active infection; (d) intraoperative photos shows complete resection of the L5 vertebra with mesh graft filled with autogenous bone graft; (e, f) last follow-up anteroposterior and lateral radiograph showing bony bridging and fusion.

to 11.1 ± 4.20 in the final follow-up ($t = 20.369$, $P < 0.001$) (Fig. 3).

A Pearson correlation was run to determine the relationship between the change in lumbosacral angle in kyphosis and the lumbar and pelvic parameters at the final follow-up. There was a negative correlation between the change in the local kyphotic angle (LKA) and the change in the pelvic parameters, which was statistically significant for the degree of change in PT ($r = -0.680$, $n = 12$, $P = 0.015$) and degree of change in SS ($r = -0.661$, $n = 12$, $P = 0.019$), whereas it shows a positive correlation with the final PT degree ($r = 0.642$, $n = 12$, $P = 0.024$). No correlation was found between the change in the LKA and the final LKA, SS, LL, and PI-LL mismatch. Table 1 shows the correlation between the different parameters in the final follow-up (Fig. 4).

A comparison of the health-related quality of life scores (HRQoL scores), between the preoperative and postoperative period, demonstrated that the

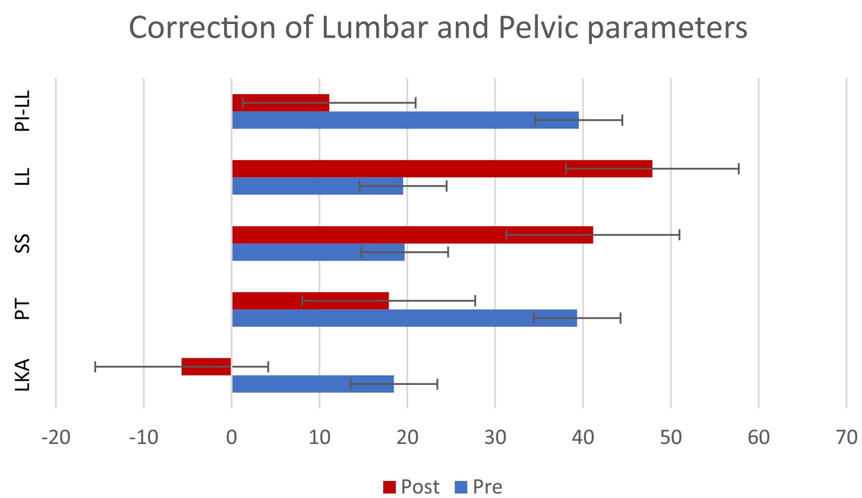

Fig. 2. Operated case with spondylodiscitis L5—S1 with severe collapse and destruction of L5, (a) preoperative plain radiograph of the patient, (b, c) preoperative computed tomography (CT) and MRI images of the patient (d, e) postoperative radiograph of the patient, (f, g) preoperative (2.4) and postoperative (−15.6) local kyphotic angle, and (h, j) preoperative (−25) and postoperative (−43.2) lumbar lordosis.

preoperative clinical scores improved significantly after surgery. The VAS for back pain improved from 8.92 ± 0.79 to 1.83 ± 0.57 ($t = 47.652$, $P < 0.001$) in the final follow-up with a correction rate of 79.69%. ODI improved significantly from 74.50 ± 8.86 preoperative to 22.50 ± 3.20 postoperatively ($t = 19.612$, $P < 0.001$, correction rate of 69.43%). No significant correlation was found between final HRQoL scores and the different spinopelvic radiological parameters, except for final PT, which was negatively correlated with the final VAS for back pain ($r_s = -0.661$, $n = 12$, $P = 0.019$) (Table 2).

Discussion

In the current study, we retrospectively reviewed 12 patients with local kyphotic lumbosacral deformity who underwent PVCR involving lumbosacral junction in a single health institute at Zagazig University in the period from 2014 to June 2020. To the best of our knowledge, this is one of the few studies on patients with lumbosacral deformity with a single pathology (pyogenic spondylodiscitis of L5). The patients included in the study were followed up for at least more than 12 months, with a median of 16 months.

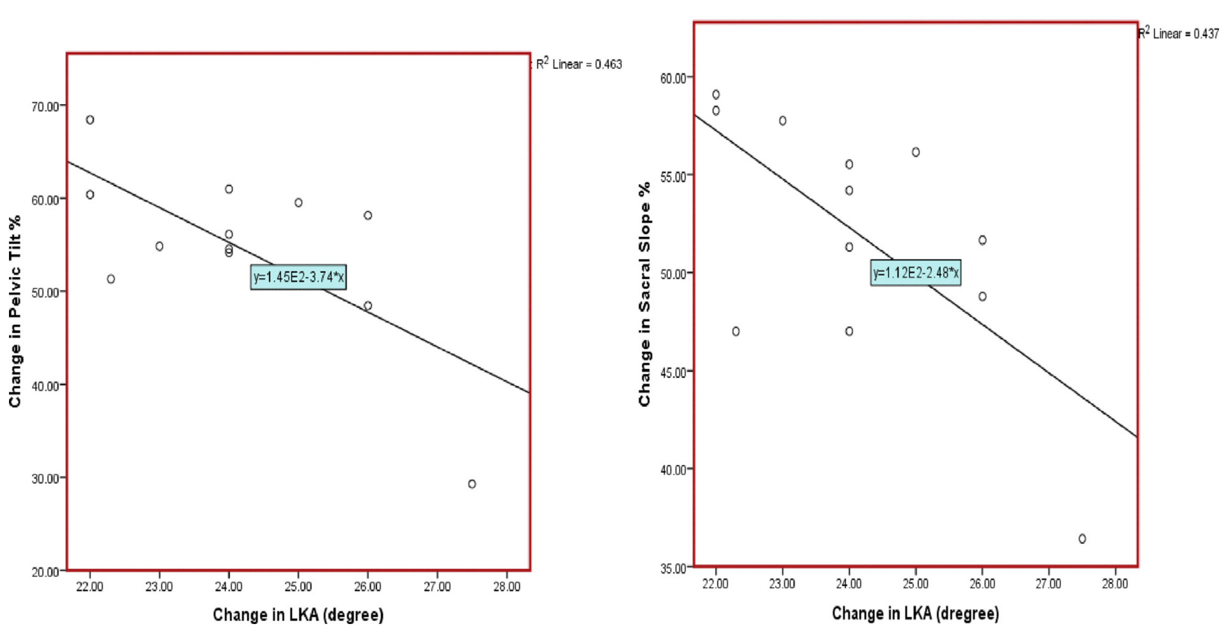

Fig. 3. Bar chart showing the degree of changes in the lumbar and pelvic parameters from preoperative to the final follow-up.

Table 1. Correlations between local kyphotic angle and different lumbar and pelvic radiological parameters.

Parameters	Post LKA	Postpelvic tilt	Postsacral slope	Postlumbar lordosis	Post-PI-LL mismatch	Change in sacral slope	Change in pelvic tilt	Change in LKA
Post LKA								
Pearson correlation	1	−0.590[a]	0.740[b]	0.344	−0.142	0.498	0.683[a]	−0.511
Sig. (2-tailed)		0.043	0.006	0.273	0.661	0.100	0.014	0.089
N	12	12	12	12	12	12	12	12
Postpelvic tilt								
Pearson correlation	−0.590[a]	1	−0.692[a]	−0.490	0.707[a]	−0.770[b]	−0.984[b]	0.642[a]
Sig. (2-tailed)	0.043		0.013	0.106	0.010	0.003	0.000	0.024
N	12	12	12	12	12	12	12	12
Postsacral slope								
Pearson correlation	0.740[b]	−0.692[a]	1	0.645[a]	−0.231	0.317	0.735[b]	−0.478
Sig. (2-tailed)	0.006	0.013		0.024	0.470	0.315	0.006	0.116
N	12	12	12	12	12	12	12	12
Postlumbar lordosis								
Pearson correlation	0.344	−0.490	0.645[a]	1	−0.660[a]	0.213	0.477	−0.428
Sig. (2-tailed)	0.273	0.106	0.024		0.019	0.506	0.116	0.165
N	12	12	12	12	12	12	12	12
Post-PI-LL mismatch								
Pearson correlation	−0.142	0.707[a]	−0.231	−0.660[a]	1	−0.621[a]	−0.639[a]	0.512
Sig. (2-tailed)	0.661	0.010	0.470	0.019		0.031	0.025	0.089
N	12	12	12	12	12	12	12	12
Change in sacral slope								
Pearson correlation	0.498	−0.770[b]	0.317	0.213	−0.621[a]	1	0.823[b]	−0.661[a]
Sig. (2-tailed)	0.100	0.003	0.315	0.506	0.031		0.001	0.019
N	12	12	12	12	12	12	12	12
Change in pelvic tilt								
Pearson correlation	0.683[a]	−0.984[b]	0.735[b]	0.477	−0.639[a]	0.823[b]	1	−0.680[a]
Sig. (2-tailed)	0.014	0.000	0.006	0.116	0.025	0.001		0.015
N	12	12	12	12	12	12	12	12
Change in LKA								
Pearson correlation	−0.511	0.642[a]	−0.478	−0.428	0.512	−0.661[a]	−0.680[a]	1
Sig. (2-tailed)	0.089	0.024	0.116	0.165	0.089	0.019	0.015	
N	12	12	12	12	12	12	12	12

LKA, local kyphotic angle.
[a] Correlation is significant at the 0.05 level (2-tailed).
[b] Correlation is significant at the 0.01 level (2-tailed).

The mean of the degree of correction of local kyphotic deformity in the current study was 25°, with overall correction of lumbar lordosis from 20 to 48°. These changes significantly influenced the degree of correction of the pelvic parameters such as PT, SS, and PI-LL mismatch.

The collapse of the fifth lumbar vertebra can be due to several pathologies, one of them being pyogenic spondylodiscitis. The kyphotic deformity in the lumbosacral junction secondary to this pathology may affect the movement of the sacrum and lead to sagittal and coronal spinal imbalance. Several compensatory mechanisms develop in a trial to overcome this deformity, which usually leads to forward translation of the trunk. Such postures are functionally and psychologically disabling. Several types of spinal osteotomies are described to correct different types of spinal deformity (global or local), with the variable capability of correction. Spinal osteotomies are used to correct this condition and restore the harmony of the spinopelvic balance. VCR osteotomy was described to correct severe deformity with the ability to restore the anterior column height and stability. Circumferential vertebral resection was first described by Bradford and Lauerman [9]. He reported that for 13 patients, the scoliosis curve correction was from 117 to 55° and kyphosis correction from 112 to 56°. In the original study by Suk et al. [3] describing VCR performed in a single posterior approach, 61.9% correction in the coronal plane and 45.2° in the sagittal plane were reported. Since then, PVCR has been performed by many experienced surgeons. PVCR approach has shown the advantage of correcting severe spinal deformities by minimizing anterior surgery complications and decreasing lengthy operation. PVCR is an efficient procedure that corrects deformity through a single approach; however, it needs a steep learning curve to avoid neurologic complications [10,11]. Now, it has become a gold standard technique for moderate to severe rigid spinal deformities [12–14].

In 2009, Lenke et al. [15] reported on 35 patients with rigid scoliosis and/or kyphosis who underwent

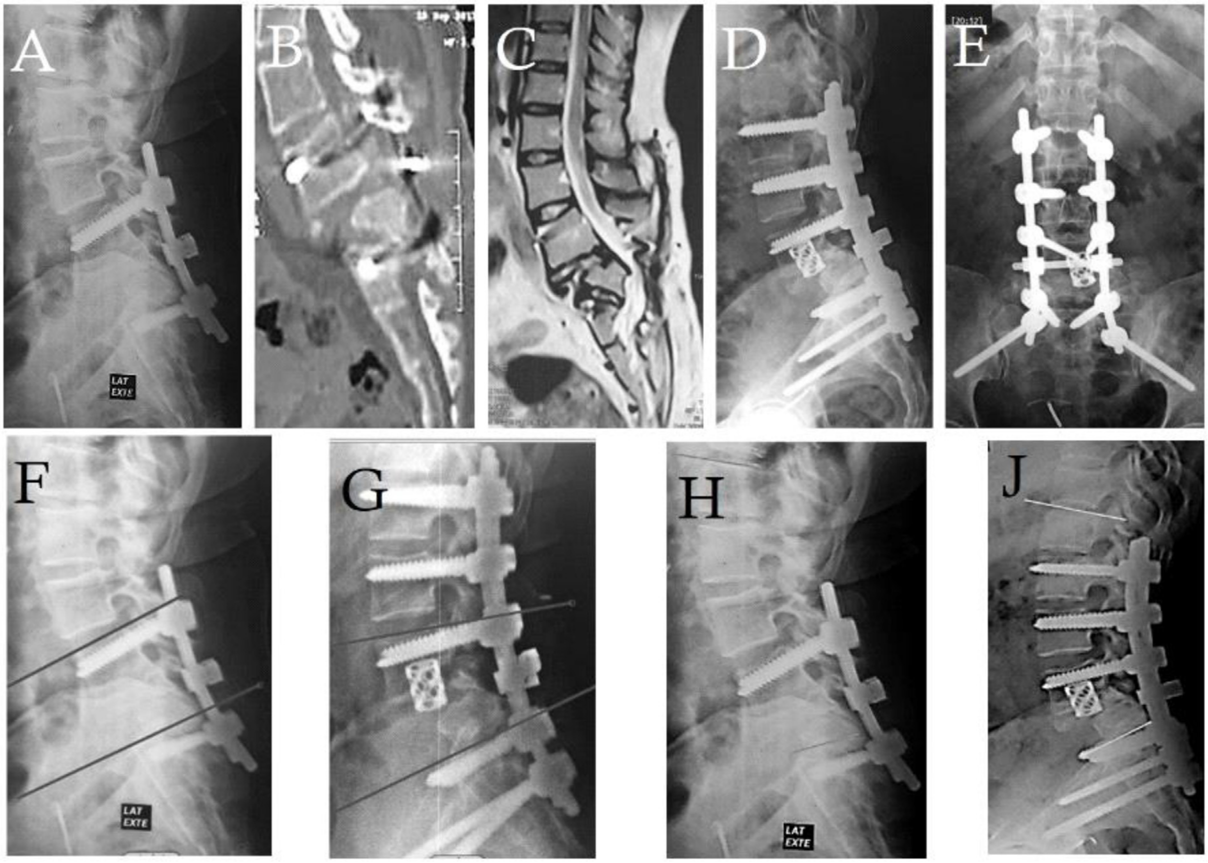

Fig. 4. Scattered dot plot chart showing the correlation between the change in local kyphotic angle in degrees and the percentage of change in the PT and SS in the final follow-up.

PVCR with correction ranging from 24° in the congenital scoliosis group to 61° in severe scoliosis group without long-term complications.

Some articles reported on PVCR for correcting thoracolumbar deformities that followed tuberculous spondylodiscitis [16–18]. A few articles were focused on fixed lumbosacral deformity secondary to L5 pathology. Suk et al. [3] reported on 25 patients with fixed lumbosacral deformity with a minimum 2 years of follow-up; they achieved a 40° correction in the sagittal plane and 60% correction in the coronal plane. The compensatory thoracolumbar curve spontaneously corrected.

Elnady et al. [19], reported on L5 corpectomy through a posterior-only approach in 17 patients. Etiology ranged from burst fractures to infection or metastatic secondaries. Three patients were lost to follow-up due to malignancy, and lumbopelvic fixation was performed. They did not comment on the improvement of sagittal parameters or coronal balance. No neurologic complications were reported. Gum et al. [20], reported on staged PVCR in three patients with spondyloptosis who had previous in situ fusion. All three patients reported significant clinical and radiological improvement.

Estimated blood loss in this patient series was 666.67 + 97.26 ml, which was found to be less than most of the previous studies, such as Bradford and Lauerman [9], with 5800 ml; Bradford and Tribus [21], with 5500 ml (circumferential approach was conducted in both studies); Suk et al. [3], with 4820 ml; Suk et al. [3], with 7034 ml; and Lenke et al. [15], with 1103 ml. This can be attributed to decreased fusion levels compared with other studies, meticulous soft tissue manipulation, and hypotensive anesthesia.

Lumbopelvic fixation was used in all patients with distal anchor reaching to S2 with S2 alar-iliac screws to achieve rigid fixation to the pelvis, decreasing the incidence of pseudoarthrosis and screw breakage complications. We believe that distal anchoring to the pelvis is needed in these patients to avoid complications and provide rigid fixation [22].

Lenke et al. [15] reported pleural effusion, brachial plexus palsy, respiratory failures, diarrhea, DVT, prolonged ileus, rod fracture, and transient nerve root palsies. In the same study, the authors

Table 2. Correlations between the final HRQoL scores and different lumbar and pelvic radiological parameters.

	Parameters	Postoperative VAS for back pain	Post-ODI
Spearman's rho			
Post LKA	Correlation coefficient	−0.195	−0.309
	Sig. (2-tailed)	0.544	0.328
	N	12	12
Post-pelvic tilt	Correlation coefficient	−0.580[a]	0.157
	Sig. (2-tailed)	0.048	0.626
	N	12	12
Post-sacral slope	Correlation coefficient	−0.059	−0.164
	Sig. (2-tailed)	0.856	0.610
	N	12	12
Post-lumbar lordosis	Correlation coefficient	−0.340	−0.505
	Sig. (2-tailed)	0.280	0.094
	N	12	12
Post PI-LL mismatch	Correlation coefficient	−0.206	0.414
	Sig. (2-tailed)	0.521	0.180
	N	12	12
Change in sacral slope	Correlation coefficient	0.282	−0.079
	Sig. (2-tailed)	0.375	0.808
	N	12	12
Change in pelvic tilt	Correlation coefficient	0.403	−0.293
	Sig. (2-tailed)	0.193	0.355
	N	12	12
Change in LKA	Correlation coefficient	0.131	0.102
	Sig. (2-tailed)	0.685	0.752
	N	12	12

ODI, Oswestry Disability Index; VAS, visual analog scale.
[b]Correlation is significant at the 0.01 level (2-tailed).
[a] Correlation is significant at the 0.05 level (2-tailed).

described those seven (18%) patients who lost their intraoperative neurogenic monitoring-evoked potential either due to subluxation of the spinal cord or due to overshortening at the osteotomy site that was corrected by the use of proper cage size, and at the end of the procedure, all patients had normal neuromonitoring and no major cord compromise.

Elnady et al. [19], reported a cut-through of an L3 screw that required metal removal and screw breakage in another patient who was asymptomatic and needed no further intervention.

Studying the correlation between the degree of correction of the LKA and the different spinopelvic parameters showed a significant positive correlation between the change in LKA and final PT, whereas there was a negative correlation between it and the degree of change in PT and SS.

Spinal alignment is essential in determining information about the patient's disability. It is proven that changes in these spinopelvic parameters, especially the PT, correlate with the improvement of the HRQoL questionnaires. Lafage et al. [23] proposed that PT could be one of the key radiological parameters in adult spinal deformities, and it is correlated with changes in HRQoL in these patients.

PVCR, in this study, proved the capability of correcting the HRQoL questionnaires, where the VAS for back pain improved from 8.92 ± 0.79 to 1.83 ± 0.57 and ODI scores from 74.5 ± 8.86 to 22.5 ± 3.20.

These findings were supported by studies that determined the correlation between the degree of correction of the lumbopelvic parameters in lumbosacral spondylolisthesis and HRQoL. They stated that the improvement of sagittal parameters is an important goal of surgery for adults with lumbosacral spondylolisthesis and that multiple radiographic sagittal parameters negatively affect HRQoL for patients [24]. This was the same in our results, where the VAS for back pain was negatively correlated with the PT with a weak but insignificant positive correlation with ODI at the final follow-up.

We believe this study has some limitations; being a retrospective study is the main issue. The low number of patients included in the study is another one, but this may be due to the narrow inclusion of only patients who suffered from pyogenic spondylodiscitis in the lumbosacral junction, with the exclusion of other pathologies that may cause spinal deformity. A short follow-up period is also considered a limitation that needs further follow-up of these patients to obtain long-term results.

Conclusion

PVCR provides a significant correction of pelvic parameters and clinical functions of patients with severe lumbosacral deformities secondary to spondylodiscitis. However, this technique needs attention to details to avoid complications.

Consent statement

All patients provided their consent in written manner prior to surgery, and the study has been approved by our institutional ethical and research review board.

Conflict of interest

There are no conflicts of interest.

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Abbreviations

AP	Anteroposterior
CT	Computed tomography
HRQoL	Health-related quality of life
L5	Fifth lumbar vertebra
LKA	Local kyphotic angle
LL	Lumbar lordosis
MRI	Magnetic Resonance Imaging
ODI	Oswestry Disability Index
PT	Pelvic tilt
PVCR	Posterior vertebral column resection
SS	Sacral slope
VAS	Visual Analogue Scale
VCR	Vertebral column resection

الملخص العربي

استعادة التوازن الفقاري الحوضي باستخدام الاستئصال الفقري الخلفي في تشوه قطني عجزي ثابت بعد التهاب القرص الفقاري القيحي

البيانات الخلفيه: ذكرت العديد من المقالات عن PVCR لتصحيح التشوهات الصدرية القطنية التي أعقبت التهاب الفقاري السلي. لكن كان التركيز أقل على التشوه القطني العجزي الثابت الثانوي لالتهاب الفقار القيحي L5.

لغرض: تحديد درجة تصحيح التوازن الفقاري الحوضي بعد PVCR من L5 في التشوهات القطنية العجزية الثابتة الثانوية لالتهاب القرص الفقاري القيحي وتحديد علاقته بالنتائج السريرية والوظيفية للمرضى.

تصميم الدراسة: دراسة استعادية

المرضى والطرق: شملت الدراسة بأثر رجعي 12 مريضا يعانون من تشوه العمود الفقري القطني الحوضي الحدبي الثابت الثانوي لالتهاب الفقار القيحي الملتئم. شملت الدراسة 7 ذكور (58.3٪) و5 إناث (41.7٪) بمتوسط عمر 37.5 ± 7.61 سنة. تم علاج المرضى بالاستئصال الفقري القطني الخلفي فقط مع تقييم مقياس الالم وإجراء الأشعة السينية العادية والتصوير المقطعي (CT) والتصوير بالرنين المغناطيسي (MRI) لجميع المرضى وتم قياس المعاملات التالية باستخدام برنامج الكمبيوتر Surgimap ؛ LL ، PI ، SS ، PT ، زاوية التشوه البؤري. ولقد تم تقييم الانصهار العظمي باستخدام الأشعة السينية بعد العملية الجراحية و / أو التصوير المقطعي. واستخدم مقياس (VAS) لكل من آلام الساق والظهر ومؤشر أوسويستري للاعاقة (ODI) قبل الجراحة وفي آخر متابعة

النتائج: استمرت فترة المتابعة 16 شهرا (12-18). تم تحقيق انصهار عظمي قوي في جميع المرضى في 8.17 ± 1.52 أشهر. لا توجد مضاعفات كبيرة بعد الجراحة. تم تصحيح متوسط تشوه الحداب معنويا إلى -5.69 درجة ± 6.77 (p<0.001). زاد قعس أسفل الظهر بشكل كبير إلى 47.89 درجة ±3.37) (p<0.001). انخفض PT بشكل ملحوظ إلى 17.88 درجة ±4.132 ، وزاد SS من 41.13 درجة ±4.01.

الخلاصه: مما سبق نستطيع ان نستنتج ان الاستئصال الفقري الخلفي PVCR يوفر تصحيحا كبيرا لمعاملات الحوض والوظائف السريرية للمرضى الذين يعانون من تشوهات قطنية عجزية ثابتة ثانوية لالتهاب الفقار القيحي.