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Summary

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Low-grade Infection In Spinal Instrumentation: Is This The Real Cause Of
Screw Loosening?

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Welcome to the Global Spine Congress 2018 (GSC). This year, AOSpine's annual event is heading to one of Asia Pacific's most multicultural cities, Singapore.

The GSC is one of the biggest gatherings for thousands of spine surgeons from all over the world. The event provides an outstanding forum to exchange ideas, network with fellow spine professionals, and learn about the latest research, techniques, and technologies in spine surgery.

The Global Spine Congress is unique in its approach to sharing knowledge and developing new approaches to the treatment of spinal disorders to help advance spine care and improve patient care. The congress is open to all surgeons, spine practitioners, allied health care professionals, and researchers, and will offer a full schedule for 4 days.

The Scientific Program will include pre-courses, AOSpine Symposia, Society Symposia, and peer-reviewed abstracts, scheduled to be presented as oral or e-poster presentations.

Since the first GSC in 2009, the number of participants and speakers attending the GSC has grown significantly. The GSC 2018 saw record-breaking numbers once again for the number of abstracts submitted. The abstracts that were accepted to be presented at the GSC are published in this special online issue as a supplement to the *Global Spine Journal*.

This book contains 727 carefully selected abstracts in the following areas:

1. Arthroplasty—cervical
2. Arthroplasty—lumbar
3. Basic Science
4. Biomechanics
5. Degenerative—cervical
6. Degenerative—lumbar
7. Deformity—thoracolumbar (Adult)
8. Deformity—thoracolumbar (Adolescent)
9. Deformity—cervical

10. Diagnostics
11. Disc degeneration
12. Epidemiology
13. Imaging
14. Infections
15. Medical economics
16. Minimally invasive spine surgery
17. Navigation
18. Nonoperative clinical treatments
19. Novel technologies
20. Spine biologics
21. Surgical complications
22. Trauma—cervical
23. Trauma—thoracolumbar
24. Trauma—other
25. Tumors

We also welcome the following international spine societies, who will be supporting the Global Spine Congress: Japanese Scoliosis Society, Korean Spinal Neurosurgery Society, European Association of Neurological Societies, Singapore Spine Society, North American Spine Society, Cervical Spine Research Society, Eurospine, Asia Pacific Spine Society, Chinese Association of Orthopedic Surgeons, Japanese Society of Spine Surgery and Related Research, Association of Spine Surgeons of India, and the Korean Society of Spine Surgery.

We are convinced that the oral presentations, symposia, and e-poster presentations will encourage lively discussions among participants and generate new ideas to help advance spine care. We hope you find it a valuable and rewarding experience.

Jeffrey C. Wang
Congress Chairperson
Global Spine Congress



E-Posters

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Arthroplasty-Cervical

P001 - Long Term Results With Activ C[®] Cervical Total Disc Replacement (CTDR)

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Introduction: Cervical disc replacement (cTDR) is a popular treatment for cervical degenerative disc disease. While some devices have shown promising results in the early and midterm, long term results remain lacking. This study reports on patient outcomes at long term follow up for the Activ C[®] prosthesis. **Materials and Methods:** Between 2007 and 2009, patients who underwent cTDR for cervical degenerative disc disease at a NHS district general hospital were included. All were assessed preoperatively and at 6, 12, 24 and 105 months after procedure with visual analogue score (VAS) for neck and arm pain severity and frequency, Neck Disability Index questionnaire (NDI) and Centre for Epidemiologic Studies Depression questionnaire (CES-D). We calculated the survival rate of implants (Kaplan- Meir curve) [end point of reoperation at same or adjacent level] and compared patient outcomes (paired t test; MedCalc[®]). **Results:** We had treated 72 patients (25 men, 47 women) with cTDR (61 radiculopathy and 11 myelopathy symptoms) with average age of 52.2 years. We were able to interview 47 patients (65% follow up rate) at long term follow up (average 105 month). VAS (mean) for neck pain improved from 6 to 2 at 12 and 24 months and comparable at 105 months (VAS = 3) [p < 0.006]. Arm pain (mean VAS) showed periodic improvement 7 to 5 (12 months); VAS 4 (24 months) and significantly better at 105 months (VAS = 3) [p < 0.006]. NDIQ (average) improved from 51 to 30 at 12 months, 35 at 24 months and 26 at 105 months (p < 0.0001). CES-D scores improved from 20 to 13 at 12 months, 18 at 24 months and 14 at 105 months

(p < 0.0001). In the smaller subgroup that underwent cTDR for myelopathy, 10 patients were followed up to 2 years but only 2 reviewed long term (7 lost to follow up, 1 dead). However, these patients only maintained improvement in arm pain seen at 2 year follow up [VAS (preop: 24m:105 m) = 6:4:3] and neck pain was worse [VAS (preop: 24m:105 m) = 6:2:6]. There was deterioration in NDIQ and CESD scores seen in early follow up period, NDIQ (preop: 24m:105 m) 51: 35: 57 and CES -D (pre, post op 2y, follow up 8y) = 20:18:17. There were no adverse events recorded at the time of procedure. There were no revisions performed at the same level, 3 patients had further adjacent level cTDR(2 at 2 years, 1 at 9 years) and median survival time was 8.62 years (7.22 to 10.05 95% CI). **Conclusion:** Cervical TDR improves pain and function in patients with cervical degenerative disc disease both in the early and long term. We are able to report a survival time of 8.6 years with the Activ C[®] prosthesis with no revision surgery performed at the same level. However, the long term benefit of cTDR performed for myelopathy is not clear.

P002 - Cervical Disc Arthroplasty: Clinical Outcomes, Heterotopic Ossification And Adjacent Segment Disease At Ten Years Follow-Up

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Introduction: Cervical disc arthroplasty (CDA) has been shown to be capable of achieving functional outcomes superior of equivalent to ACDF in selected patients. CDA has potential advantages of avoiding the complications after ACDF such as adjacent level degeneration and pseudoarthrosis, on the other hand the problem of CDA is the loss of range of motion by heterotopic ossification (HO), specially in long-term follow-up. Usually patients are young, they have a wide range of motion and tend to require a higher quality of life. Unfortunately, the durability remains largely unknown. We revised our casistic of CDA from 2003 to 2007 with minimum follow-up of



remains indicated for debridement, draining of abscess, decompression in neurological complicated patients and to halt or correct kyphotic deformity. Surgery is not indicated for patients with mild form of presentation and has no deterioration of disease after commencement of anti-tuberculosis medication. Our principle follows the currently accepted management worldwide.

P244 - Low-Grade Infection In Spinal Instrumentation: Is This The Real Cause Of Screw Loosening?

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Introduction: We investigated the hypothesis that many aseptic screw-loosening revisions in spinal instrumentations are in fact low-grade infections and not due to mechanical screw overload. **Material and Methods:** A prospective observational study was performed. All patients undergoing spinal instrumentation revision surgery between August 2015 and June 2016 were screened. In the study group all patients with an indication for revision due to screw loosening on CT-scan were included. In the control group those needing revision for adjacent disc disease were included. The rate of low-grade infection using a sonification fluid culture was analyzed. **Results:** 65 patients met all inclusion criteria. 61 patients were enrolled. Median age was 71 years (range 41-83). 33 patients (53%) were female. There were 35 (57%) and 26 (43%) patients in the study and control group, respectively. A low-grade infection was identified in 14 (40%) and 7 (26%) cases in the study and control group, respectively.

This difference was however not statistically significant. All patients with positive cultures received postoperative antibiotic treatment. **Conclusion:** The rate of low-grade infections in patients undergoing spinal instrumentation revision surgeries is high. Thereby, there were so significant differences between the control and the study group. So far, there is no clear evidence supporting the hypothesis that a low-grade infection is the cause of screw loosening.

P245 - Three Columns Involvement In Non-Tuberculous Spinal Infections

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Introduction: Non-tuberculous spondylitis is the most common form of spinal infection and approximately 80% of the cases of spinal infection are caused by staphylococcus aureus.

Involvement of the neural arch is rare in spinal infections. Typically, infectious spondylitis show involvement of two or more adjacent vertebral bodies with involvement of the intervening disc. Although there are some reports in the literature include limited number of patients with 3 column involvement in tuberculous spinal infection, 3 column involvement in non-tuberculous infection did not attract much attention. **Materials and Methods:** MRIs of all patients who had been diagnosed and surgically treated for non-tuberculous spinal infection in Sohag University Hospital, Sohag, Egypt were reviewed. All patients with 3 column involvement and proved by culture and biopsy to have non-tuberculous infection were evaluated for degree of spinal deformity, vertebral body and disc damage and paravertebral and epidural abscess formation. **Results:** Sixteen patients (10 males and 6 females) with a mean age of 66.6 years fulfilled the inclusion criteria. Infection was in the thoracic region in 2 patients, in lumbar spine in 12 patients and at the lumbosacral junction in 2 patients. Vertebral body collapse was present in 10 patients (71%) however, did not exceed 49%. Disc destruction was complete in 6 patients, and partial in 5 patients. Kyphotic deformity was not found in any case. Paraspinal and epidural abscesses were found in 88% and 69% respectively. **Conclusion:** Three column spinal involvement in non-tuberculous infection might be not so rare. It seems to be commoner in the lumbar spine. Vertebral body and disc destruction and paraspinal and epidural abscesses are common in these case.

P246 - Pyogenic Spondylodiscitis: Mid-Term Results Of Surgically Managed Patients

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Introduction: Spondylodiscitis was defined as the infection involving intervertebral discs and vertebral bodies. It was reported to be mainly caused by pyogenic and granulomatous agents and to cause high rates of morbidity and mortality. Surgical treatment was advocated when medical treatment was not sufficient by taking the pathology under control. There is still an ongoing debate about the ideal surgical technique for the treatment of pyogenic spinal infections. The aim of this study was to present the mid-term results of patients diagnosed with pyogenic spondylodiscitis (PSD). **Material and Methods:** Twenty-seven patients (14 females, 13 males) operated between 2006-2016 with a diagnosis of pyogenic (bacterial) spondylodiscitis were evaluated retrospectively. Among them, 19 patients who came regularly to follow-up appointments and could fill clinical questionnaires were enrolled in the study. Patients co-morbidities, pre- and post-operative VAS scores, post-operative SF-36 scores, pre- and post-operative