



Open Cervical Foraminotomy: A Systematic Review

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Abstract

Foraminotomy is a surgical technique for augmenting the zone where the spinal nerve roots leave the spinal segment. A foramen is the opening around the nerve root, and otomy alludes to the therapeutic strategy for developing the opening. In this method, specialists augment the path to soothe weight where the spinal nerve is being crushed in the foramen.

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Introduction

Cervical Foraminotomy

The spine is made of a section of bones. Each bone, or vertebra, is framed by a round piece of bone, called a vertebral body. The spinal waterway is an empty tube framed by the hard rings of the considerable number of vertebrae. The spinal waterway encompasses and ensures the spinal line inside the spine. There are seven vertebrae in the neck that frame the zone known as the cervical spine. The vertebrae are isolated by intervertebral circles.

Going starting from the brain through the spinal section, the spinal line conveys nerve branches through openings on both sides of every vertebra. These openings are known as the neural foramina. (The term used to portray a solitary opening is foramen.)

The intervertebral plate sits straightforwardly before the opening. A lump or herniated plate can limit the opening and put weight on the nerve. An aspect joint sits toward the rear of the foramen. Bone goads that shape on the aspect joint can extend into the passage, narrowing the gap and squeezing the nerve.

Material and Methods

What do specialists would like to accomplish?

Foraminotomy reduces the manifestations of foraminal stenosis. In foraminal stenosis, a nerve root is packed inside the neural foramen. This pressure is generally the aftereffect of degenerative (or wear and tear) changes in the spine.

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Wear and tear from rehashed stresses and strains on the neck can make a spinal plate start to crumple. As the space between the vertebral bodies recoils, the opening around the nerve root limits. This crushes the nerve. The nerve root is further pressed in the foramen when the aspect joint coating the external edge of the foramen ends up plainly aroused and extended subsequently of the same degenerative changes.

The degenerative procedure can likewise make bone goads form and point into the foramen, bringing on additional disturbance. In a foraminotomy, the specialist evacuates the tissues around the edges of the foramen, basically enlarging the opening so as to take weight off the nerve root.

Arrangements

By what method will I plan for surgery?

The choice to continue with surgery must be made mutually by you and your specialist. You ought to comprehend however much about the strategy as could reasonably be expected. On the off chance that you have concerns or inquiries, you ought to converse with your specialist.

When you choose surgery, you have to make a few strides. Your specialist may recommend an entire physical examination by your customary specialist. This exam guarantees that you are in the most ideal condition to experience the operation.

Upon the arrival of your surgery, you will presumably be admitted to the clinic at a young hour in the morning. You shouldn't eat or drink anything after 12 pm the prior night.

Surgical Procedure

What occurs amid the operation?

Patients are given a general anesthesia to put them to rest amid most spine surgeries. For shorter methods, for example, foraminotomy, patients are typically given a gas type of anesthesia through a veil. As you rest, you're breathing might be helped with a ventilator. A ventilator is a gadget that controls and screens the stream of air to the lungs.

This surgery is typically finished with the patient lying face down on the working table. The specialist makes an entry point down the center of the back of the neck. The skin and delicate tissues are isolated as an afterthought where the spinal nerves are compacted. A few specialists utilize a surgical magnifying instrument amid the strategy to amplify the zone they'll be dealing with.

The specialist may utilize a little, rotating cutting instrument (a burr) to shave within edge of the aspect joint. This opens up the external edge of the neural foramen. The burr is in some cases used to shave a little segment of the hard ring on the back of the vertebra above and underneath the influenced nerve root.

Little slicing instruments are utilized to painstakingly evacuate delicate tissues inside the neural foramen. The specialist takes out any little circle sections that are available and rub off adjacent bone goads. Along these lines, strain and weight are removed the nerve root.

The muscles and delicate tissues are set up back, and the skin is sewed together. Patients are now and then put in a delicate neckline after surgery to keep the neck situated easily.

Inconveniences

What may turn out badly?

Likewise with all major surgical methods, confusions can happen. Probably the most widely recognized complexities taking after foraminotomy incorporate issues with anesthesia, thrombophlebitis, contamination, nerve harm, continuous torment.

This is not planned to be an entire rundown of the conceivable entanglements, yet these are the most widely recognized.

Issues with Anesthesia

Issues can emerge when the anesthesia given amid surgery causes a response with different medications the patient is taking. In uncommon cases, a patient may have issues with the anesthesia itself. Also, anesthesia can influence lung work in light of the fact that the lungs don't extend too while a man is under anesthesia. Make certain to talk about the dangers and your worries with your anesthesiologist.

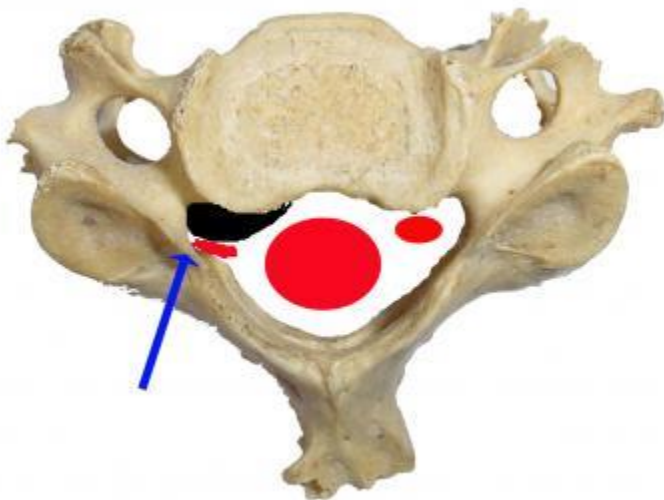


FIG. 1: Image showing the Anterior cervical discectomy and fusion

Discussion

The Thrombophlebitis (Blood Clots)

Thrombophlebitis, at times called profound venous thrombosis, can happen after any operation. It happens when the blood in the huge veins of the leg frames blood clusters. This may make the leg swell and turn out to be warm to the touch and difficult. In the event that the blood coagulations in the veins break separated, they can go to the lung, where they hold up in the vessels and remove the blood supply to a bit of the lung. This is known as an aspiratory embolism. (Pneumonic means lung, and embolism alludes to a section of something going through the vascular framework.) Most specialists consider averting important. There are numerous approaches to lessen the danger, however presumably the best is making them move as quickly as time permits. Two other normally utilized precaution measures incorporate weight tights to keep the blood in the legs moving
meds that thin the blood and keep blood clusters from framing

Disease

Disease taking after spine surgery is uncommon yet can be an intense inconvenience. A few contaminations may appear early, even before you leave the doctor's facility. Diseases on the skin's surface typically leave with anti-microbials. More profound diseases that spread into the bones and delicate tissues of the spine are harder to treat and may require extra surgery to treat the contaminated part of the spine.

Nerve Damage

Any surgery that is done close to the spinal waterway

Cervical Foraminotomy can conceivably make damage the spinal line or spinal nerves. Harm can happen from knocking or cutting the nerve tissue with a surgical instrument, from swelling around the nerve, or from the arrangement of scar tissue. A harm to these structures can bring about muscle shortcoming and lost sensation to the ranges provided by the nerve.

Progressing Pain

Numerous patients get almost entire torment help from the foraminotomy method. Likewise with any surgery, be that as it may, you ought to expect some agony a short time later. On the off chance that the torment proceeds or ends up noticeably unendurable, converse with your specialist about medications that can help control your agony.

What occurs after surgery?

Patients are typically ready to get up inside a hour or two after surgery. Your specialist may have you wear a delicate neck neckline. If not, you will be told to move your neck just precisely and easily.

Most patients leave the healing facility the day after surgery and are sheltered to drive inside possibly 14 days. Individuals by and large return to light work by four weeks and can do heavier work and games inside a few months.

Outpatient active recuperation is generally recommended when patients have additional agony or show critical muscle shortcoming and deconditioning.

Conclusion

Restoration

What would it be advisable for me to expect amid my recuperation?

Restoration after foraminotomy surgery is by and large required for just a brief timeframe. On the off chance that you require outpatient exercise based recuperation, you will most likely need to go to treatment sessions for two to four weeks. You ought to anticipate that full recuperation will take up to a few months.

Numerous specialists endorse outpatient non-intrusive treatment inside four weeks after surgery. At to begin with, medications are utilized to help control agony and irritation. Ice and electrical incitement medications are generally used to help with these objectives. Your advisor may likewise utilize knead and different hands-on medications to straightforwardness muscle fit and agony.

Dynamic medicines are included gradually. These incorporate activities for enhancing heart and lung work. Strolling, stationary cycling, and arm cycling are perfect cardiovascular activities. Specialists additionally show particular activities to help tone and control the muscles that settle the neck and upper back.

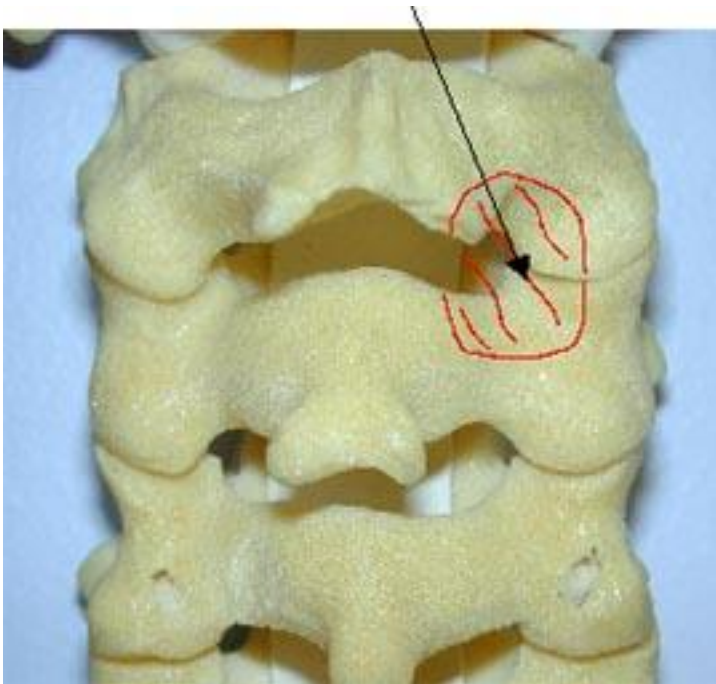


FIG. 2: The amount of bony removal (in red)

Your specialist works with you on the best way to move and do exercises. This type of treatment, called body mechanics, is utilized to help you grow new development propensities. This preparation helps you guard your neck in positions as you approach your work and every day exercises. At in the first place, this might be as basic as helping you figure out how to move securely and effectively all through bed, how to get dressed and stripped, and how to do some of your standard exercises. At that point you'll figure out how to protect your neck while you lift and convey things and as you do heavier.

REFERENCE

1. Damandeep Kour, et al. Variation in the Kinematic Response of Cervical Spine, Proprioception and Muscle Activity During Anterior Load Carriage-An Experimental Study. *J Nov Physiother* 2014;4:236.
2. Kanthika Wasinpongwanich, et al. Are Deer and Boar Spines a Valid Biomechanical Model for Human Spines?. *J Spine*. 2014;3:187.
3. Enrico Farabegoli, et al. Dragging Instead of Lifting: A New Spine Stretcher Concept. *J Spine*. 2014;3:183.
4. Billy B Kristensen, et al. High-Volume Infiltration Analgesia in Major Lumbar Spine Surgery. A Randomized, Placebo-Controlled, Double-Blind Trial. *J Anesth Clin Res*. 2014;5:450.
5. Jerome Fryer, et al. The Hypnic Reflex, Postulated to be a Monosynaptic Reflex Generated from Spine Stretching as the Muscles Relax around the Intervertebral Discs. *J Sleep Disord Ther*. 2014;3:1102.
6. Jose Aso-Escario, et al. Upper Thoracic Spine Fractures Treated by Posterior Transpedicular Corpectomy, Expandable Cage and Fusion: Literature Review and Report of a Case of T4 Severe Burst Fracture. *Int J Neurorehabilitation Eng*. 2014;1:117.
7. Joaquim Soares Do Brito, et al. Extensive Involvement of the Dorsal Spine by Tuberculous Infection and Surgical Treatment with Percutaneous Spinal Instrumentation. *J Infect Dis Ther*. 2014;2:156.
8. Lars Homagk, et al. Therapy of Spine Metastasis Causing Paralysis Symptoms “ Operation and Rehabilitation. *Surgery*. 2014;10:2.
9. Lolwah Ahmad Al-Rashed, et al. Effectiveness of Non-Pain-Contingent Spine Rehabilitation in Females with Chronic Low Back Pain: A Randomized Controlled Trial. *Int J Phys Med Rehabil*. 2015;3:260.
10. Robyn Rubenstein, et al. Thoracolumbar Injury Severity Scoring Systems: A Review and Rationale for a New System Based on the AOSpine Thoracolumbar Injury Classification System. *Int J Phys Med Rehabil* 2015;3:257.
11. Akbar Shoukat Ali, et al. Intradural Extramedullary Ependymoma at Lumbar (L1-L4 Level) Spine: A Suspicious Case and Literature Review. *J Clin Case Rep*. 2015;5:572.
12. Abiola O Ogundele, et al. Influence of Selected Pain Characteristics on Segmental Spine Range of Motion in Patients with Low-Back Pain. *J Ergonomics*. 2015;5:138.
13. Claudio Spinelli, et al. Habitual Joint Dislocations and Recurrent Multiple Hernias: An Unusual Connective Tissue Disease?. *J Clin Case Rep*. 2015;5:563.
14. Chougule VN, et al. Patient Specific Bone Modeling for Minimum Invasive Spine Surgery. *J Spine*. 2015;4:249.
15. Gun Choi, et al. Motion Preserving Techniques for Treating Cervical Radiculopathy. *J Spine*. 2015;4:247.
16. Salkov M, et al. The Method of Multilevel Decompression of Thoracic Spine with the Durotomy and the Local Administration of Cortixin in the Setting in Intradural Space in the Patients with Spinal Cord Injury. *Int J Neurorehabilitation Eng*. 2015;2:173.
17. Luiz Pimenta, et al. Minimally Invasive Lateral Approach to the Thoracic Spine Case Report and Literature Overview. *J Spine*. 2015;4:240.
18. Jose Antonio Becerra Fontal, et al. Evaluation of Health Related Quality of Life in Patients Candidate for Spine Surgery. *J Spine*. 2015;4:239.
19. Azedine Medhkour, et al. Acute Left-sided Foot Drop Attributed to Recurrent Synovial Chondromatosis of the Lumbar Spine. *J Spine*. 2015;4:230.

20. Sharma A, et al. Cellular Therapy, a Novel Treatment Option for Intellectual Disability: A Case Report. *J Clin Case Rep.* 2015;5:483.
21. Andrei V. Baskov, Igor A. Borshchenko, Anatoly B. Shekhter, Vladimir A. Baskov, Anna E. Guller Sobol, et al. Long Term Clinical Results in Laser Reconstruction of Spine Discs. *J Spine* 2015;4:210.
22. Roger Marks, et al. Use of Dexmedetomidine (Precedex) for Spine Surgery. *J Spine.* 2015;4:e115.
23. Benyahia N-M, Breebaart MB, Sermeus L and Vercauteren M, et al. (2015) Regional Analgesia Techniques for Spine Surgery: A Review with Special Reference to Scoliosis Fusion. *J Spine* 2015;4:208.
24. Justin Magee, et al. (2015) Three Dimensional Digital Modelling of Human Spine Anthropometrics and Kinematics from Meta-Analysis. How Relevant is Existing Anatomical Research?. *J Spine.* 2015;4:205
25. Jie Zhu, et al. Leukocytosis of Unknown Etiology in a Patient with a Spinal Cord Stimulator. *J Spine.* 2015;4:204.
26. Anke Scheel-Sailer, et al. The Future of Clinical Research in the Field of Spine. *J Spine* 2015;4:e116.
27. Reinard KA, et al. Intradural Tophaceous Gout of the Cavernous Sinus and Spine: Case Report and Review of Literature. *J Neurol Disord.* 2015;3:234.
28. Tarek Sunna P, et al. Intradural Lumbar Disc Herniation Associated with degenerative Spine Disease. *Int J Neurorehabilitation Eng.* 2015;2:153.
29. Alessandro Landi, et al. Facet Wedge Fixation in Lumbar Spine Degenerative Pathology: A New Option for Minimally-Invasive Posterior Approach?. *Orthop Muscul Syst.*
30. Yusuf Muhammed Durna, et al. The Case of Papillary Thyroid Carcinoma Presented with Lumbar Spine Metastasis. *Otolaryngol (Sunnyvale).* 2015;5:89.
31. Umesh C Parashari, et al. A Rare Case of Renal Cell Carcinoma in Left Renal Ectopia with Cervical Spine Metastasis Presented as Quadriparesis. *Med Surg Urol.* 2014;4:149.
32. Francesco Travascio, et al. Implications of Decompressive Surgical Procedures for Lumbar Spine Stenosis on the Biomechanics of the Adjacent Segment: A Finite Element Analysis. *J Spine.* 2015;4:220.
33. Mende KC, et al. Comparison of Dual Level Fusion and Hybrid Treatment in the Cervical Spine Based on Patient Outcome. *J Spine.* 2015;4:218.
34. Marcelo Wajchenberg, Michel Kanas, Delio E Martins, Luciano Miller Reis Rodrigues, Reinaldo Jesus Garcia and Eduardo Barros Puertas, et al. Chordoma of the Cervical Spine in a Competition Athlete: Case Report and Long-term Follow Up. *J Spine.* 2015;4:216.
35. Shamim Ahmad Bhat, et al. Concomitant Pyogenic Spondylodiscitis with Large Psoas Abscess in Known Case of Tuberculosis Spine; Presenting as Refractory Tuberculosis. *J Spine.* 2015;4:212.
36. Mehmet Resid Onen, et al. Pediatric Spine Trauma. *J Spine.* 2015;4:211.
37. Balioglu MB, et al. Escobar Syndrome Associated with Spine and Orthopedic Pathologies: Case Reports and Literature Review. *Hereditary Genet* 2015;4:45.
38. Kumar saurav, et al. Synthesis and Processing of Zirconia- Spinel Refractory Ceramics. *IJIRSET.*
39. Desmoulin GT, et al. A Biomechanical Method for Reconstruction of Tumbling Trampoline- Associated Cervical Spine Injuries Using Human and Anthropometric Test Dummy Data. *Journal of Forensic Biomechanics.*
40. Jie Zhu, Gabriella Gutman, Jeremy Giere Collins and Jennifer Colonna, et al. (2015) A Review of Surgical Techniques in Spinal Cord Stimulator Implantation to Decrease the Post-Operative Infection Rate. *J Spine.* 2015;4:202.

41. Paul Mintken, et al. Shoulder Pain and Regional Interdependence: Contributions of the Cervicothoracic Spine. *J Yoga Phys Ther.*
42. Quan V Vuong, et al. Phenolic Compounds, Antioxidant and Anti-Cancer Properties of the Australian Maroon Bush *Scaevola spinescens* (Goodeniaceae). *J Bioanal Biomed.* 2015.
43. Bouali Sofiene, et al. Primary Spinal Epidural Rhabdomyosarcoma of the Upper Thoracic Spine. *J Spine.* 2014;3:193.
44. Hamaoui A, et al. Seat Design, Spine Curvature and Intradiscal Pressure. *J Ergonomics.* 2014;4:e124.
45. Archana Rani, et al. Complete Non-fusion of the Sacral Spines: A Rare Phenomenon. *Medical and Health Sciences.*
46. Alok Sharma, et al. Seizures as an Adverse Event of Cellular Therapy in Pediatric Neurological Disorders and its Prevention. *J Neurol Disord.* 2014;2:164.
47. Christopher Yeung, et al. Clinical Validation of Allogeneic Morphogenetic Protein: Donor Intervariability, Terminal Irradiation and Age of Product is not Clinically Relevant. *J Spine.* 2014, 3: 173.
48. Hai Le, et al. Cervical Spine Ependymoma with Hematomyelia: Case Report and Review of the Literature. *J Spine.* 2014;3:171.
49. Frank Spinelli, et al. The Sexually Abused Man's Relationship with his Physician. *J Clin Case Rep.* 2016;6:893.
50. Alessandro Landi, et al. The Anterior Retroperitoneal Approach to the Degenerative Lumbar Spine: Clinico-Therapeutic Remarks. *J Spine.* 2016;5:347.
51. Nalinee Kovitwanawong, et al. A Comparison of Cervical Spine Movement during Tracheal Intubation when Using a Pentax Airway Scope or the GlideScope Video Laryngoscopy with Fluoroscopy. *J Anesth Clin Res.* 2016.
52. Gun Choi, et al. Epiduroscopic Assisted Percutaneous Endoscopic Lumbar Discectomy: A Technical Report. *J Neurol Disord.* 2016;4:306.
53. Anthony T Yeung, et al. Current Defies of Neurological Disorders. *J Neurol Disord.* 2016, 4: e120.
54. Tulay Ozer, et al. Computed Tomographic Evaluation of Degenerative Spine Changes in Patients with Obstructive Sleep Apnea Syndrome: A Case Control Study. *J Sleep Disord Ther.* 2016;5:253.
55. Rahul Pramod Patil, et al. Comparative Study Between Short Segment Open Versus Percutaneous Pedicle Screw Fixation with Indirect Decompression in Management of Acute Burst Fracture of Thoracolumbar and Lumbar Spine with Minimal Neurological Deficit in Adults. *J Spine.* 2016;5:339.
56. Bahaa Ali kornah, et al. Minimally Invasive Spine Osteosynthesis (MISO) Technique for Fractures Spine: A Case Series 14 Cases. *J Trauma Treat.* 2016;5:336.
57. Suha N Aloosi, et al. Contribution of Cervical Spine in Temporomandibular Joint Disorders: A Cross-Sectional Study. *J Interdiscipl Med Dent Sci.*
58. Anthony T Yeung, et al. Transforaminal Endoscopic Surgery: Its Role in the Treatment of Painful Conditions of an Aging Spine. *J Neurol Disord.* 2016;4:302.
59. Samir Zahaf, et al. The Effect of the Posterior Loading on the Spine of a School Child. *Adv Cancer Prev.* 2016;1:112.
60. Gun Choi, et al. A New Progression Towards a Safer Anterior Percutaneous Endoscopic Cervical Discectomy: A Technical Report. *J Spine.* 2016;5: 329.
61. Tongning Wang, et al. (2016) Tuberculous Pseudoaneurysm of Descending Abdominal Aorta in Association with Tuberculosis of Spine: A Rare Complication. *Vasc Med Surg.* 2016;4:279.

62. Mahesh BH, et al. Emphysematous Osteomyelitis - A Rare Cause of Gas in Spine - A Case Report. *J Spine*. 2016;5:320.
63. Dulce A Velázquez-Zamora, et al. Administration of Anastrozole to Ovariectomized Rats Impairs Working Memory in Association with Plastic Changes to Dendritic Spines on Prefrontal Third-layer Pyramidal Neurons. *J Steroids Horm Sci*. 2016;7:179.
64. Paul S Sung, et al. One Leg Standing Test: A Quantification of the Neuromuscular System for Spine Research and Practice. *J Pain Relief*. 2016;5:256.
65. Maria Jose Moreno Martinez, et al. Spine Fracture in Ankylosing Spondylitis. About a Case. *Rheumatology (Sunnyvale)*.
66. Akihiko Hayashi, et al. Microendoscopic Posterior Decompression for the Treatment of Lumbar Lateral Recess Stenosis. *J Spine*. 2016;5:317.
67. Maximilian Leiblein, et al. Transmanubrial Approach for Fracture of Lower Cervical Spine (C7) in Elderly Patients: A Case Report. *J Spine*. 2016;5:316.
68. Alessandro Ramieri, et al. (2016) Non-Posterior Subtraction Osteotomy Surgery to Restore Lumbar Lordosis in the Hidden Sagittal Imbalance of the Adult Degenerative Spine. *J Spine* 2016;5:315.
69. Yan Wang, Chuiguo Sun, Zhongqiang Chen and Fabo Feng, et al. (2016) Evaluation of Progression of Ossification of Ligamentum Flavum in the Thoracic Spine Using Computed Tomography. *J Spine*. 2016;5:306.
70. Bolandhemat N, et al. Structural, Electronic and Magnetic Properties of Geometrically Frustrated Spinel CdCr₂O₄ from First-principles Based on Density Functional Theory. *J Material Sci Eng*. 2016;5:250.
71. Wood ML, et al. Cervical Spine Synovial Chondromatosis: A Case Report and Literature Review. *Med Rep Case Stud*. 2016;1:114.
72. Alok Sharma, et al. PET - CT Scan Shows Decreased Severity of Autism after Autologous Cellular Therapy: A Case Report. *Autism Open Access*.
73. Neisevilie Nisa, et al. Anaesthetic Management of an Achondroplastic Dwarf with Difficult Airway and Spine for Total Hip Replacement: A Case Report. *Gen Med*. 2016.
74. Alessandro Landi, et al. Early Decompressive Surgery in Traumatic Thoraco-Lumbar Spine: When and Why?. *J Spine*. 2016;5:301.
75. Anne-Laure Couderc, et al. Prognostic Factors in Elderly Patients with Multiple Myeloma Treated with Weekly Bortezomib. *J Integr Oncol*. 2016;5:162.
76. Yonge RP, et al. Frailty Screening and Pre-habilitation in Older Spine Patients Reversing the Effects of Sedentary Life-styles to Improve Surgical Outcomes for Older Patients and Reduce Healthcare Costs. *J Osteopor Phys Act*. 2016;4:171.
77. Andrey Bokov, et al. Pedicle Screw Loosening Prediction in Patients with Degenerative Diseases of Lumbar Spine Using Bone Density Measured in Hounsfield Units. *J Osteopor Phys Act*. 2016;4:162.
78. Jung-Hee Lee, et al. Intraosseous Malignant Peripheral Nerve Sheath Tumor of the Thoracic Spine: A Case Report and Review of Literature. *J Orthop Oncol*.
79. Stephen Lewis, et al. Traumatic Disc Herniation Following Flexion-Distraction Injury of the Thoracolumbar Spine: A Rare Presentation. *J Trauma Treat*. 2016;5:293.

80. Shein AP, et al. The Spinal Cord Pyramidal Structures Reaction to Intraoperative Instrumental Correction of Spine Deformity. *J Spine* 2016;5:292.
81. Ashraf F Hanna, et al. Intravenous Ketamine Produces Long-Term Pain Relief in a Patient with Fibromyalgia. *Fibrom open*. 2016;1:104.
82. Yasuhito Kaneko, et al. Minimally Invasive Transforaminal Lumbar Interbody Fusion for Lumbar Disc Lesion with Modic Changes. *J Spine*. 2016;5:289.
83. Ramesh Muthu, et al. A Missed Diagnosis of Cervical Spine Fracture in Alcohol Intoxicated Patient. *Emerg Med*. 2016;6:300.
84. Teresa Calabro, et al. Systemic Amyloidosis with Predominant Spine Involvement: A Case Report. *Orthop Muscular Syst*. 2016.
85. Óscar Garcia- Algar, et al. Genomic Alterations in Ethanol-Exposed Trophoblast Cell Lines Induced by Chronic Ethanol Treatment. *J Steroids Horm Sci*. 2015;6:164.
86. Anthony T. Yeung, et al. Moving Away from Fusion by Treating the Pain Generator: The Secrets of an Endoscopic Master. *J Spine*. 2015;4:e121.
87. Chan Hong Park, et al. Efficacy of Nucleo-Annuloplasty Using Disc-Fx in Lumbar Disc Herniation. *J Spine*. 2015;4:275.
88. Geniere Nigrag S, et al. Picked Up by a Wasp? Watch Out the Spine! A Case of Multifocal Pyogenic Spondylodiscitis. *J Clin Case Rep*. 2015;5:627.
89. Makhlof MT, et al. Nano-Crystalline Co₃O₄ Spinel Prepared by Combustion Method as a Catalyst for Direct Decomposition of N₂O. *Journal of Chemistry*.
90. Mohammed YTA, et al. Utilization of Intra-Operative Visual Evoked Potential in Long Spine Surgery: Case Report. *J Neurol Neurophysiol*. 2015;6:332.
91. Massel DH, et al. Multimodal Analgesia in Spine Surgery: A Commentary. *J Pain Relief*. 2015;4:218.
92. Andarcia Bañuelos Cesar, et al. A Rare Complication of Lumbar Spine Surgery: Pneumocephalus. *J Spine*. 2015;S6-001.
93. Luca di Girolamo, et al. Blood Volume Determination Through New Generation 130/0,4 Hydroxyethyl-Starch: A Propaedeutic, In-Vitro Study. *Pharm Anal Acta*. 2015;6:441.
94. Ozgur Tosun, et al. Penetrating Stab Injury of Spine; Diagnostic Value of Thin-Section Multislice Computed Tomography. *J Spine*. 2015;4:264.
95. Qingyi He, et al. Can XLIF Surgery Treat the Lumbar Spine Infection?. *J Trauma Treat*. 2015;4:264.
96. Akbar Shoukat Ali, et al. Intradural Extramedullary Ependymoma at Lumbar (L1-L4 Level) Spine: A Suspicious Case and Literature Review. *J Clin Case Rep*. 2015;S3:004.
97. Myung-Sang Moon, et al. Age-Related Incidences of Spondylosis of the Lower Cervical Spine Radiographic Study of 460 Jeju Islanders. *J Spine*. 2015;4:258.
98. Kingsley R. Chin, et al. Avoidance of Wrong Level Surgery in the Lumbar Spine: A Technical Report. *J Spine*. 2015;4:257.
99. Pawel Zwolak, et al. Management of Metastatic Tumours to the Cervical Spine. *J Spine*. 2015;4:253.
100. Nikola Dragojlovic, et al. Communicating Hydrocephalus due to Traumatic Lumbar Spine Injury: Case Report and Literature Review. *Int J Phys Med Rehabil*. 2015;3:299.

- 101.Chen CW, et al. Surgical Site Infection Following Spine Surgery: Diagnostic Potential of CRP, ESR, and WBC in Predicting Infection. *Emerg Med.* 2015;5:277.
- 102.Ahimsa Porter Sumchai, et al. The Human Spine is like a Precious Strand of Pearls. *J Women's Health Care.* 2015;4:258.