List of 10 Best Publications

1. **Bhavuk Garg,** Manish Gupta, Menaka Singh, Dinesh Kalyansundaram. Outcome and safety analysis of 3D-printed patient-specific pedicle screw jigs for complex spinal deformities: a comparative study. The Spine Journal, 19, 2019, 56-64. DOI: 10.1016/j.spinee.2018.05.001

   Pioneered the use of 3D printing technology and rapid prototyping in India for 'safe' screw placement in complex spinal deformity surgery. Spinal deformities are difficult to treat worldwide. In India, these deformities are often neglected and present at a very late and much more deformed state when their treatment becomes even more challenging. Only very few centers treat these deformities in India and the waiting list itself runs into years in these centers because of patient overload. Surgical treatment of these disorders carries a high risk of neurological complications and majority of these complications occur due to misplaced pedicle screws because of deformed anatomy. Developing 3D printed patient-specific drill templates has enabled an average spine surgeon to treat these patients with much ease and safety. This step has created a further platform to extend this technology for other orthopedic disorders, especially in management of neglected injuries and deformities of other bones, which are again fairly common in India as compared to the western world. This technique has an ability to size the screw to the patient's anatomy and also helps the surgeon to accurately place pedicle screws in the deformed spine. Additionally, advantages of this technique include reduced operating time and intra-operative blood loss and risk of postoperative complications as well.

2. **Bhavuk Garg**, Gupta M, Mehta N, Malhotra R. Influence of Etiology and Onset of Deformity on Spatiotemporal, Kinematic, Kinetic and Electromyography Gait Variables in Patients with Scoliosis – A Prospective, Comparative Study. Spine. March 15, 2021 - Volume 46 - Issue 6 - p 374-382. PMID: 33620181, doi: 10.1097/BRS.0000000000003796. **(Impact Factor: 3.49).**

   Established Gait lab in Department of Orthopaedics, AIIMS, New Delhi where Gait analysis is performed in surgical planning of different orthopaedics deformities.
   The aim of our study was to compare the spatiotemporal, kinematic, kinetic and electromyographic (EMG) gait variables in patients with adolescent idiopathic scoliosis (AIS) and congenital scoliosis and to compare these gait variables of scoliosis patients with healthy controls. Our findings confirm the previous findings of literature regarding the alteration in gait patterns in scoliosis patients when compared to normal individuals. However, the lack of difference in gait analysis

variables between AIS and congenital scoliosis patients suggests that this alteration in gait is secondary to the existence of the deformity and does not correlate with the onset or etiology of deformity.

3. Kafle G, **Garg B**, Mehta N, Sharma R, Singh U, Kandasamy D, Das P, Chowdhury B. Diagnostic yield of image-guided biopsy in patients with suspected infectious spondylodiscitis: a prospective study from a tuberculosis-endemic country. The Bone & Joint Journal. 2022, Jan 1;104(1):120-6. doi: 10.1302/0301-620X.104B1.BJJ-2021-0848.R2. **(Impact Factor: 4.3).**

   The aims of this study were to determine the diagnostic yield of image- guided biopsy in providing a final diagnosis in patients with suspected infectious spondylodiscitis, to report the diagnostic accuracy of various microbiological tests and histological examinations in these patients, and to report the epidemiology of infectious spondylodiscitis from a coun-try where tuberculosis (TB) is endemic, including the incidence of drug- resistant TB. Image- guided biopsy has a reasonably high diagnostic yield in patients with suspected in-fectious spondylodiscitis. A combination of histological examination, Xpert MTB/RIF assay, bacterial culture, and sensitivity provides high diagnostic accuracy in a country in which TB is endemic.

4. **Garg B** , Mehta N. "Epidemiological Insights from 1652 Patients with Spinal Tuberculosis Managed at a Single Centre: A Retrospective Review of 5-year Data". Asian Spine J, 2021 Sep 1. PMID: **34461687**, DOI: 10.31616/asj.2021.0137**.**

   Purpose of our study was to report the demographic characteristics, clinico-radiological presentation, laboratory findings, and outcomes of “middle-path” treatment in patients with spinal tuberculosis from a single public healthcare facility in a developing country. Our findings confirm the widespread prevalence of spinal tuberculosis and describe various epidemiological charac-teristics of a large sample of spinal tuberculosis patients. Adoption of the “middle-path” regimen is associated with high compliance and favourable outcomes in spinal tuberculosis.

5. **Bhavuk Garg**, Mehta N, Bansal T, Shekhar S, Khanna P, Baidya DK. Design and Implementation of an Enhanced Recovery After Surgery (ERAS) Protocol in Elective Lumbar Spine Fusion by Posterior Approach: A Retrospective, Comparative Study. Spine (Phila Pa 1976), 2021 Jun 15;46(12):E679-E687**,** PMID: **33315772**. DOI: 10.1097/BRS.0000000000003869 **.**

Developed a multidisciplinary Enhanced Recovery after Surgery (ERAS) protocol for lumbar spine surgery. ERAS is a patient-centric approach to perioperative care of patients who are operated upon – where strategic interventions are made in the course of a patient's surgical journey to make the patient's recovery smoother and faster. In a comparative study, the ERAS protocol was found to reduce the length of hospital stay and improve early patient outcomes.

6. **Bhavuk Garg**, Upendra BN, Jayaswal A. Microendoscopic versus open discectomy for lumbar disc herniation: a prospective randomised study. J Orthop Surg (Hong Kong) 2011 Apr;19(1):30-4. PMID: **21519072**, DOI: 10.1177/230949901101900107. **Citations: 188**
   Aim of our study was to compare the outcomes of microendoscopic discectomy (MED) versus open discectomy for lumbar disc herniation. Both methods are equally effective in relieving radicular pain. MED entailed shorter hospital stay, less morbidity, and earlier return to work. Nonetheless, it is a demanding technique and should not be attempted without specific instruction and training.

7. **Bhavuk Garg,** Kandwal P, Goswami A, Upendra BN, Jayaswal A. Anterior vs. posterior approach for thoracolumbar tuberculosis. Indian journal of Orthopaedics. 2012:46(2):165-170. DOI: 10.4103/0019-5413.93682.**Citations: 150.**
   Approach for surgical treatment of thoracolumbar tuberculosis has been controversial. The aim of our study was to compare the clinical, radiological and functional outcome of anterior versus posterior debridement and spinal fixation for the surgical treatment of thoracic and thoracolumbar tuberculosis. Though the anterior approach is an equally good method for debridement and stabilization, kyphus correction is better with posterior instrumentation and the posterior approach is associated with less morbidity and complications.

8. **Bhavuk Garg**, Kotwal PP "Giant cell tumor of tendon sheath: whom to give postoperative radiotherapy (AIIMS Classification)". Journal of Orthopaedic Surgery, 2011;19 (2): 218-20. PMID: **21857049**, DOI: 10.1177/230949901101900218 **Citations: 57.**
   Postoperative radiotherapy may have a role in reducing recurrence of the giant cell tumour of the tendon sheath of the hand.

9. **Bhavuk Garg**, Manhas V, Vardhan A, Srivastava DN, Das CJ, Vibha D, Gupta V, Malhotra R, Kotwal P. Thumb Opposition Recovery Following Surgery for Severe Carpal Tunnel Syndrome: A

Clinical, Radiological, and Electrophysiological Pilot Study. J Hand Surg Am. 2019 Feb; 44(2):157.e1-157.e5**.** doi: 10.1016/j.jhsa.2018.05.004. Citations: 13.

To objectively assess recovery of thumb opposition in patients with carpal tunnel syndrome (CTS) after open carpal tunnel release and to evaluate electrophysiological and magnetic resonance (MR) neurography findings as predictors of thumb opposition recovery. Patients suffering from severe CTS with thenar atrophy and detectable CMAP-APB showed promising improvement following open carpal tunnel release.

10. **Bhavuk Garg, Mehta N.** Modified Posterior Vertebral Column Resection for Severe Spinal Deformity: A Retrospective, Comparative Study, The Spine Journal, 2020 Sep;20(9):1446-1451. PMID**: 32335271**, DOI: 10.1016/j.spinee.2020.04.014. **(Impact Factor: 4.16).**

Posterior vertebral column resection (PVCR) has several advantages over a combined anterior-posterior procedure for management of severe, rigid spinal deformities. The technique, described by Suk et al., has a high complication rate. Modifications of the technique which can reduce this complication rate might make this challenging procedure safer. Our retrospective study with a small cohort suggests that the authors' modified technique of PVCR, wherein the posterior elements are preserved until just prior to attempting to correct the deformity, may be safer in terms of neurological complications when compared with the conventional technique.