

# CURRICULUM VITAE

## **Park, Sang-Min. M.D.**

**Place of birth:** Republic of Korea

**Present nationality:** Republic of Korea



### **Contact**

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### **Current Academic Appointment**

Associate Professor

Spine Center and Department of Orthopaedic Surgery

Seoul National University College of Medicine and Seoul National University Bundang Hospital

### **Qualification**

Orthopaedic Surgery Board Certified, in Korea

### **Specialty**

Degenerative lumbar spine surgery, Minimally invasive spine surgery, Endoscopic spine surgery, Osteoporosis, Spine tumor, Mixed reality, Medical twin

### **Education**

Ph.D.	Clinical Medical Sciences, College of Medicine, Seoul National University, Seoul, Korea	Ongoing
M.S.	Orthopedic Science, College of Medicine, Chung-Ang University, Seoul, Korea	Aug. 31. 2014
M.D. & B.S.	College of Medicine, Chung-Ang University, Seoul, Korea	Feb. 28. 2010

### **Medical License and Orthopedic Board**

Board of Medicine. Ministry of Health & Welfare, Korea Feb. 23. 2010

Orthopedic Surgery, Ministry of Health & Welfare, Korea Mar. 02. 2015

## Professional Experience

*March 2021 –*

*Associate Professor*

Spine Center, Department of Orthopedic Surgery, Seoul National University Bundang Hospital, Seongnam, Republic of Korea

*March 2017 – Feb 2021*

*Assistant Professor*

Spine Center, Department of Orthopedic Surgery, Seoul National University Bundang Hospital, Seongnam, Republic of Korea

*March 2016 – Feb 2017*

*Co-Director, Spine Center*

Spine Center, Department of Orthopedic Surgery, CM General Hospital, Seoul, Korea

*March 2015 – Feb. 2016*

*Clinical Spine Surgery Fellow*

Department of Orthopedic Surgery, Seoul National University Hospital, Seoul, Korea

*March 2011 – Feb. 2015*

*Resident*

Department of Orthopedic Surgery, Chung-Ang University Hospital, Seoul, Korea

*March 2010 – Feb. 2011*

*Internship*

Chung-Ang University Hospital, Seoul, Korea

## Honors and Awards

**8. Best clinical paper award of Asian Spine Journal.** The 3<sup>rd</sup> International Congress of the Korean Society of Spine Surgery. May, 2022

“Surgical Causes of Significant Intraoperative Neuromonitoring Signal Changes in Three-Column Spinal Surgery. Asian Spine J. 2021”

**7. Excellent editorial board member award of Asian Spine Journal.** The 3<sup>rd</sup> International Congress of the Korean Society of Spine Surgery. May, 2022

**6. Best clinical paper award.** The 38th Fall Congress Korean Society of Spine Surgery. Nov, 2021

“Medical Care Utilization Behavior for Diagnosis and Treatment for Spine disease: A Questionnaire-based Study of Orthopaedic Spine Center Outpatients at a Tertiary Educational Hospital. J Korean Soc Spine Surg. 2020”

**5. Best poster award.** The 7th Seoul Symposium on Bone Health. June 1, 2019

“Trends of incidence and fatality of vertebral fractures in Korea using nationwide claims data”

**4. Best clinical paper award.** The 36th Spring Congress Korean Society of Spine Surgery. May, 2019

“Spinal instability neoplastic score (SINS) influencing surgical decision making for treatment of spine metastasis. J Korean Soc Spine Surg. 2018”

**3. Young Investigator Award.** Korean Society of Spine Surgery, May, 2019

**2. Best Staff Award.** Seoul National University Hospital, July, 2015

**1. Best Resident Award.** Chung-Ang University Hospital, June, 2011

## Membership in Societies

Member, Korean Orthopedic Association (KOA)  
Member, Korean Society of Spine Surgery (KSSS)  
Member, Korean Society for Bone and Mineral Research (KSBMR)  
Member, Korean Society of Spine Tumor (KSST)  
Member, Korean Society for the Advancement of Spine Surgery (KOSASS)  
Member, Korean Orthopedic Pain Society  
Member, North American Spine Society (NASS)  
Member, Spine Society of Europe (EUROSPINE)  
Member, AOSpine  
Member, Asia Pacific Spine Society (APSS)

### **Other activities**

Editor, Journal of the Korean Orthopaedic Association (JKOA), Since 2020  
Editor, Asian Spine Journal (ASJ), Since 2020  
Editor, Journal of Advanced Spine Surgery (JASS), Since 2021  
Website Committee, Korean Society of Spine Surgery (KSSS), Since 2020  
Spinal Cord Research Committee, Korean Society of Spine Surgery (KSSS), Since 2017  
Scientific Committee, Korean Society of Spine Tumor (KSST), Since 2019  
Scientific Committee, Korean Society of the Advancement of Spine Surgery (KOSASS), Since 2020  
Secretary, Epidemiology Committee, Korean Society for Bone and Mineral Research (KSBMR), 2019 – 2022  
Epidemiology Committee, Korean Society for Bone and Mineral Research (KSBMR), Since 2019  
Field Doctor, Team for LG Twins (Korean Professional Baseball Team), Since 2018  
Reviewer, SPINE (Phila Pa 1976), Since 2016  
Reviewer, European Spine Journal, Since 2016  
Reviewer, Journal of Korean Society of Spine Surgery, Since 2021  
Reviewer, Clinics in Orthopedic Surgery, Since 2021  
Program Committee and Preparatory Committee, PASMIS 2020  
Scientific Committee, ISASS AP 2023

### **Papers published in international journals**

64. Kim JG, Hong JY, Park J, **Park SM**, Han K, Kim HJ, Yeom JS. Risk of fracture according to temporal changes of low body weight changes in adults over 40 years: a nationwide population-based cohort study. BMC Public Health. 2023. May [**Corresponding**] [Accepted]
63. **Park SM**, Park J, Han S, Jang HD, Hong JY, Han K, Kim HJ, Yeom JS. Underweight and risk of fractures in adults over 40 years using the nationwide claims database. Sci Rep. 2023 April. [**First author**] [Accepted]

62. Lee CK, Li QY, Park J, **Park SM**, Kim HJ, Chang BS, Woo B, Yeom JS. A Novel Trajectory of C7 Lamina Screws Determined using 3-Dimensional CT and Surgical Simulation Software: Comparison with a Pre-existing Trajectory. *Asian Spine J.* 2023 Mar. [Co-author] [Accepted]
61. Kim JS, Lee JH, Lee DC, Shin SH, Keum HJ, Choi YS, Eun SS, Shin SH, Hong HJ, Kim JY, Kim TH, Lim W, Kim J, **Park SM**, Park HJ, Lee HJ. Evaluation of the efficacy and safety of conventional and interlaminar full-endoscopic decompressive laminectomy to treat lumbar spinal stenosis (ENDO-F Trial): Protocol for a prospective, randomized, multicenter trial. *PLoS One.* 2023 Apr 5;18(4):e0283924. doi: 10.1371/journal.pone.0283924. eCollection 2023. [Co-author]
60. Kang MS, Park HJ, **Park SM**, You KH, Ju WJ. Learning Curve for Biportal Endoscopic Posterior Cervical Foraminotomy Determined Using the Cumulative Summation Test. *J Orthop Surg Res.* 2023 Feb 27;18(1):146. doi: 10.1186/s13018-023-03611-0. [Co-author]
59. Kim JG, **Park SM**, Kim HJ, Yeom JS. Development and validation of a risk-prediction nomogram for chronic low back pain using a national health examination survey: A cross-sectional study. *Healthcare (Basel).* 2023 Feb 6; 11(4), 468. doi: 10.3390/healthcare11040468. [Corresponding]
58. Kwon BT, Kim HJ, Lee S, Park SM, Ham DW, Park HJ, Kwon O, Yeom JS. Feasibility and safety of a CaO-SiO<sub>2</sub>-P<sub>2</sub>O<sub>5</sub>-B<sub>2</sub>O<sub>3</sub> bioactive glass ceramic spacer in posterior lumbar interbody fusion compared with polyetheretherketone cage: A prospective randomized controlled trial. *Acta Neurochir (Wien).* 2023 Jan;165(1):135-144. doi: 10.1007/s00701-022-05429-x. Epub 2022 Dec 6. [Corresponding]
57. **Park SM**, Park J, Han S, Jang HD, Hong JY, Han K, Kim HJ, Yeom JS. The Impact of Persistent Low Weight Status on the Occurrence of Vertebral Fractures: A Nationwide Population-Based Cohort Study. *J Korean Med Sci.* 2023 Feb 20;38(7):e48. doi.org/10.3346/jkms.2023.38.e48. Epub 2023 Feb 03. [First author]
56. Park HJ, Choi JY, Lee WM, **Park SM**. Prevalence of low back pain and its associated factors in the general population of South Korea: A cross-sectional study using the National Health and Nutrition Examination Surveys. *J Orthop Surg Res.* 2023 Jan 11;18(1):29. doi: 10.1186/s13018-023-03509-x. [Corresponding]
55. **Park SM**, Lee HJ, Park HJ, Choi JY, Kwon O, Lee S, Kim HJ, Yeom JS. Biportal Endoscopic versus Microscopic Discectomy for Lumbar Herniated Disc: A Randomized Controlled Trial. *Spine J.* 2023 Jan;23(1):18-26. doi: 10.1016/j.spinee.2022.09.003. Epub 2022 Sep 23. [First author]
54. Park HJ, Choi JY, You KH, Kang MS, Lee WM, Hyun JT, **Park SM**. Clinical and radiologic outcomes of biportal endoscopic lumbar discectomy in obese patients: a retrospective case-control study. *BMC Musculoskelet Disord.* 2022 Dec 22;23(1):1117. doi: 10.1186/s12891-022-06082-2. [Corresponding]
53. Choi JY, **Park SM**, Kim HJ, Yeom JS. Recent Updates on Minimally Invasive Spine Surgery: Techniques, Technologies, and Indications. *Asian Spine J.* 2022 Dec;16(6):1013-1021. doi: 10.31616/asj.2022.0436. Epub 2022 Dec 27. [Corresponding]
52. Ham DW, Kim HJ, **Park SM**, Park J, Chang BS, Chung J, Yeom JS. Effects of preoperative spinopelvic compensation states on the patient-reported outcomes of adult spinal deformity surgery: three-dimensional motion analysis results. *Eur Spine J.* 2022 Dec;31(12):3687-3695. doi: 10.1007/s00586-022-07419-0. Epub 2022 Oct 14. [Co-author]
51. Park J, Park HJ, **Park SM**, Choi JY, Kim HJ, Yeom JS. Learning curve for microscopic unilateral laminectomy for bilateral decompression surgery using the cumulative summation test for learning curve. *Medicine (Baltimore).* 2022 Oct 7;101(40):e31069. doi: 10.1097/MD.00000000000031069. [Corresponding]
50. Kim C, Bekar O, Seo H, **Park SM**, Lee D. Computed tomography vertebral segmentation from multi-vendor scanner data. *Journal of Computational Design and Engineering.* 2022;9(4):1650-64. doi: 10.1093/jcde/qwac072. [Co-author]
49. Choi JY, Park HJ, **Park SM**, Kang CN, Song KS. Evaluation of the efficacy and safety of Escherichia coli-derived recombinant human bone morphogenetic protein-2 in transforaminal lumbar interbody fusion to treat Degenerative Spinal Disease: A Protocol of prospective, randomized, Assessor -blinded, multicenter trial. *J Orthop Surg Res.* 2022 Aug 31;17(1):397. doi: 10.1186/s13018-022-03289-w. [Corresponding]
48. Kang MS, You KH, Han SY, **Park SM**, Choi JY, Park HJ. Percutaneous Full-Endoscopic versus Biportal Endoscopic Posterior Cervical Foraminotomy for Unilateral Cervical Foraminal Disc Disease. *Clin Orthop*

Surg. 2022 Dec;14(4):539-547. doi: 10.4055/cios22050. Epub 2022 Jul 28. [Co-author]

47. Yu MH, Hong N, Lee S, Kim HY, Park HS, **Park SM**, Lee YK, Kim TY, Ha YC, Rhee Y, Koo KH. Operational Definition Identifying Osteoporotic Vertebral Fractures in the Claims Database. *J Korean Med Sci*. 2022 Aug 15;37(32):e249. doi: 10.3346/jkms.2022.37.e249. [Corresponding]

46. Kwon O, Lee S, **Park SM**, Yeom JS, Kim HJ. A Complement Type to SRS-Schwab Adult Spinal Deformity Classification: The Failure of Pelvic Compensation. *Spine (Phila Pa 1976)*. 2022 Sep 15;47(18):1295-1302. doi: 10.1097/BRS.0000000000004404. Epub 2022 Jun 30. [Co-author]

45. Kang DH, Lee S, Kim HJ, **Park SM**, Yeom JS. Probability for surgical treatment in patients with lumbar spinal stenosis according to the stenotic lesion severity: a 5-10-year follow-up study. *BMC Musculoskelet Disord*. 2022 Jun 14;23(1):573. doi: 10.1186/s12891-022-05510-7. [Co-author]

44. Ham DW, Kim HJ, **Park SM**, Park SJ, Park J, Yeom JS. The importance of thoracolumbar junctional orientation, thoracolumbar junctional angle's change, and overcorrection of lumbar lordosis in development of proximal junctional kyphosis in adult spinal deformity surgery. *J Neurosurg Spine*. 2022 Jul 8;37(6):874-882. doi: 10.3171/2022.5.SPINE211528. Print 2022 Dec 1. [Co-author]

43. Kim JS, Lee JH, Lee DC, Shin SH, Keum HJ, Choi YS, Eun SS, Shin SH, Hong HJ, Kim JY, Kim TH, Lim W, Kim J, **Park SM**, Park HJ, Lee HJ. Comparative study of the efficacy and safety of minimally invasive interlaminar full-endoscopic discectomy versus conventional microscopic discectomy in single-level lumbar herniated intervertebral disc (ENDO-F Trial): A multicenter, prospective, randomized controlled trial protocol. *J Ortho Surg Res*. 2022 Mar 28;17:187. doi.org/10.1186/s13018-022-03052-1. [Co-author]

42. Kwon O, Ham DW, Kim HJ, Lee S, **Park SM**, Yeom JS. Determining a Cutoff Value for Hand Grip Strength to Predict Favorable Outcomes of Adult Spinal Deformity Surgery. *Global Spine J*. 2022 Feb 26;21925682221078238. doi: 10.1177/21925682221078238. [Co-author]

41. **Park SM**, Song KS, Kim HJ, Park SY, Kang T, Kang MS, Heo DH, Park CK, Lee DG, Hwang JS, Jang JW, Kim JY, Kim JS, Lee HJ, Yoon JH, Park CW, You KH, Park HJ. Comparing the efficacy and Safety of minimally invasive biportal endoscopic spine surgery versus conventional microscopic discectomy in single-level lumbar herniated intervertebral disc (ENDO-BH Trial): a multicenter, prospective, randomized controlled equivalence trial study protocol. *Trials*. 2022 Feb 22;23(1):172. doi: 10.1186/s13063-022-06094-2. [First author]

40. Wi SM, **Park SM**, Chang SY, Lee J, Kim SM, Chang BS, Kim H. Surgical Causes of Significant Intraoperative Neuromonitoring Signal Changes in Three-Column Spinal Surgery. *Asian Spine J*. 2021 Dec;15(6):831-839. doi: 10.31616/asj.2021.0078. Epub 2021 Dec 20. [Co-author]

39. Park HJ, **Park SM**, Song KS, Kim HJ, Park SY, Kang T, Kang MS, Heo DH, Park CK, Lee DG, Hwang JS, Jang JW, Kim JY, Kim JS, Lee HJ, Yoon JH, Park CW, You KH. Evaluation of the efficacy and safety of conventional and biportal endoscopic decompressive laminectomy in patients with lumbar spinal stenosis (ENDO-B Trial): A protocol for a prospective, randomized, assessor-blind, multicenter trial. *BMC Musculoskelet Disord*. 2021 Dec 20;22(1):1056. doi: 10.1186/s12891-021-04959-2. [Co-First author]

38. Yeo JB, Lee E, Lee JW, Kim BR, Kang Y, Ahn JM, **Park SM**, Kang HS. Immediate postoperative MRI findings after lumbar decompression surgery: Correlation of imaging features with clinical outcome. *J Clin Neurosci*. 2021 Jul;89:365-374. doi: 10.1016/j.jocn.2021.05.045. Epub 2021 Jun 2. [Co-author]

37. Ham DW, Han H, Kim HJ, **Park SM**, Chang BS, Yeom JS. Risk factors for acute proximal junctional kyphosis after adult spinal deformity surgery in preoperative motion analysis. *Eur Spine J*. 2021 May;30(5):1215-1225. doi: 10.1007/s00586-021-06830-3. Epub 2021 Apr 2. [Co-author]

36. **Park SM**, Go SJ, Han H, Park JW, Lee YK, Kim HJ, Yeom JS, Koo KH. Risk factors for subsequent vertebral fractures following a previous hip fracture. *J Bone Miner Metab*. 2021 Mar;39(2):193-200. doi: 10.1007/s00774-020-01133-x. Epub 2020 Jul 18. [First author]

35. Kim HJ, **Park SM**, Kwon OS, Han H, Kang KT, Yeom JS. Improvement in gait pattern and its relationship with preoperative pelvic compensation after surgery in patients with sagittal plane deformity. *Spine (Phila Pa 1976)*. 2021 Jan 1;46(1):E56-E64. doi: 10.1097/BRS.0000000000003722. [Corresponding author]

34. Ahn SH, **Park SM**, Park SY, Yoo JI, Jung HS, Nho JH, Kim SH, Lee YK, Ha YC, Jang S, Kim TY, Kim HY. Osteoporosis and Osteoporotic Fracture Fact Sheet in Korea. *J Bone Metab*. 2020 Nov;27(4):281-290. doi:

10.11005/jbm.2020.27.4.281. Epub 2020 Nov 30. [Co-First author]

33. Kwon BT, Kim HJ, Yang HJ, **Park SM**, Chang BS, Yeom JS. Comparison of sacroiliac joint degeneration between patients with sagittal imbalance and lumbar spinal stenosis. *Eur Spine J.* 2020 Dec;29(12):3038-3043. doi: 10.1007/s00586-020-06558-6. Epub 2020 Aug 9. [Co-author]

32. Kwon O, Kim HJ, Shen F, **Park SM**, Chang BS, Lee CK, Yeom JS. Influence of Hand Grip Strength on Surgical Outcomes After Surgery for Adult Spinal Deformity. *Spine (Phila Pa 1976).* 2020 Nov 15;45(22):E1493-E1499. doi: 10.1097/BRS.0000000000003636. [Co-author]

31. Chang SY, Son J, **Park SM**, Chang BS, Lee CK, Kim H. Predictive Value of Comprehensive Geriatric Assessment on Early Postoperative Complications Following Lumbar Spinal Stenosis Surgery: A Prospective Cohort Study. *Spine (Phila Pa 1976).* 2020 Nov 1;45(21):1498-1505. doi: 10.1097/BRS.0000000000003597. [Co-author]

30. Park J, Ham DW, Kwon BT, **Park SM**, Kim HJ, Yeom JS. Minimally Invasive Spine Surgery: Techniques, Technologies, and Indications. *Asian Spine J.* 2020 Oct;14(5):694-701. doi: 10.31616/asj.2020.0384. Epub 2020 Oct 14. [Corresponding author]

29. Wi W, **Park SM**, Shin BS. Computed Tomography-Based Preoperative Simulation System for Pedicle Screw Fixation in Spinal Surgery. *J Korean Med Sci.* 2020 May 11;35(18):e125 [Co-first author]

28. **Park SM**, Ahn SH, Kim HY, Jang S, Ha YC, Lee YK, Chung HY. Incidence and mortality of subsequent vertebral fractures: analysis of claims data of the Korea National Health Insurance Service from 2007 to 2016. *Spine J.* 2020 Feb;20(2):225-233. doi: 10.1016/j.spinee.2019.09.025. Epub 2019 Oct 4. [First author]

27. **Park SM**, Park J, Jang HS, Heo YW, Han H, Kim HJ, Chang BS, Lee CK, Yeom JS. Biportal endoscopic versus microscopic lumbar decompressive laminectomy in patients with spinal stenosis: A randomized controlled trial. *Spine J.* 2020 Feb;20(2):156-165. doi: 10.1016/j.spinee.2019.09.015. Epub 2019 Sep 19. [First author]

26. Jung HS, Nho JH, Ha YC, Jang S, Kim HY, Yoo JI, **Park SM**, Lee YK. Incidence of Osteoporotic Refractures Following Proximal Humerus Fractures in Adults Aged 50 Years and Older in Korea. *J Bone Metab.* 2019 May;26(2):105-111. doi: 10.11005/jbm.2019.26.2.105. Epub 2019 May 31. [Co-author]

25. **Park SM**, Kim GU, Kim HJ, Choi JH, Chang BS, Lee CK, Yeom JS. Is the use of unilateral biportal endoscopic approach associated with rapid recovery after lumbar decompressive laminectomy? A preliminary analysis of a prospective randomized controlled trial. *World Neurosurg.* 2019 Aug;128:e709-e718. doi: 10.1016/j.wneu.2019.04.240. Epub 2019 May 9. [First author]

24. **Park SM**, Kim GU, Kim HJ, Kim H, Chang BS, Lee CK, Yeom JS. Low handgrip strength is closely associated with chronic low back pain among women aged 50 years or older: A cross-sectional study using a national health survey. *PLoS One.* 2018 Nov 26;13(11):e0207759. doi: 10.1371/journal.pone.0207759. eCollection 2018. [First author]

23. **Park SM**, Kim GU, Kim HJ, Kim H, Chang BS, Lee CK, Yeom JS. Walking more than 90 minutes/week was associated with a lower risk of self-reported low back pain in persons over 50 years of age: A cross-sectional study using the Korean National Health and Nutrition Examination Surveys. *Spine J.* 2019 May;19(5):846-852. doi: 10.1016/j.spinee.2018.11.007. Epub 2018 Nov 15. [First author]

22. **Park SM**, Kim HJ, Kim GU, Choi MH, Chang BS, Lee CK, Yeom JS. Learning curve for lumbar decompressive laminectomy in biportal endoscopic spinal surgery (BESS) using the cumulative summation test for learning curve (LC-CUSUM). *World Neurosurg.* 2019 Feb;122:e1007-e1013. doi: 10.1016/j.wneu.2018.10.197. Epub 2018 Nov 4. [First author]

21. Riew KD, Yang JJ, Chang DG, **Park SM**, Yeom JS, Lee JS, Jang EC, Song KS. What is the Most Accurate Radiographic Criteria to Determine Anterior Cervical Fusion? *Spine J.* 2019 Mar;19(3):469-475. doi: 10.1016/j.spinee.2018.07.003. Epub 2018 Jul 7. [Co-author]

20. **Park SM**, Shen F, Kim HJ, Kim H, Chang BS, Lee CK, Yeom JS. How many screws are necessary to be considered an experienced surgeon for freehand placement of thoracolumbar pedicle screws? Analysis of the learning curve using the cumulative summation test for learning curve (LC-CUSUM). *World Neurosurg.* 2018 Oct;118:e550-e556. doi: 10.1016/j.wneu.2018.06.236. Epub 2018 Jul 6. [First author]

19. Park JW, **Park SM**, Lee HJ, Lee CK, Chang BS, Kim H. Infection following percutaneous vertebral augmentation with polymethylmethacrylate. *Arch Osteoporos*. 2018 Apr 27;13(1):47. doi: 10.1007/s11657-018-0468-y. [Co-author]
18. **Park SM**, Kim HJ, Jeong H, Kim H, Chang BS, Lee CK, Yeom JS. Longer sitting time and low physical activity are closely associated with chronic low back pain in population over 50 years of age: a cross-sectional study using national health survey. *Spine J*. 2018 Nov;18(11):2051-2058. doi: 10.1016/j.spinee.2018.04.003. Epub 2018 Apr 17. [**First author**]
17. **Park SM**, Park C, Kim H, Kim HJ, Yeom JS, Lee CK, Chang BS. Is Redo Vertebroplasty an Effective Treatment on the Same Vertebra? *Cardiovasc Intervent Radiol*. 2018 Jul;41(7):1058-1066. doi: 10.1007/s00270-018-1920-5. Epub 2018 Mar 6. [**First author**]
16. **Park SM**, Kim HJ, Jang S, Kim H, Chang BS, Lee CK, Yeom JS. Depression is closely associated with chronic low back pain in patients over 50 years of age: a cross-sectional study using the sixth Korea National Health and Nutrition Examination Survey (KNHANES VI-2). *Spine (Phila Pa 1976)*. 2018 Sep 15;43(18):1281-1288. doi: 10.1097/BRS.0000000000002595. [**First author**]
15. **Park SM**, Kim HJ, Lee S, Chang BS, Lee CK, Yeom JS. Radiographic and clinical outcomes of robot-assisted posterior lumbar interbody fusion: A two-year results from a randomized controlled trial. *Yonsei Med J*. 2018 May;59(3):438-444. doi: 10.3349/ymj.2018.59.3.438. [**First author**]
14. **Park SM**, Park JW, Kim H, Kim HJ, Yeom JS, Lee CK, Chang BS. Morphological changes of vertebral compression fracture with intra-vertebral cleft treated with percutaneous vertebroplasty. *J Orthop Sci*. 2018 Mar;23(2):237-247. doi: 10.1016/j.jos.2017.11.006. Epub 2017 Nov 23. [**First author**]
13. Park JW, **Park SM**, Lee HJ, Lee CK, Chang BS, Kim H. Mortality following benign sacral insufficiency fracture and associated risk factors. *Arch Osteoporos*. 2017 Nov 9;12(1):100. doi: 10.1007/s11657-017-0395-3. [Co-author]
12. **Park SM**, Park JW, Lee HJ, Choi JY, Yoo HJ, Lee CK, Chang BS, Kim H. Diagnostic value of technetium-99m bone scintigraphy in the detection of cervical spine metastases in oncological patients. *Spine (Phila Pa 1976)*. 2017 Nov 15;42(22):1699-1705. doi: 10.1097/BRS.0000000000002183. [**First author**]
11. Ha JH, Kim SH, **Park SM**, Lee CK, Chang BS, Kim H. Geriatric risk in the surgical management of infectious spondylitis. *Geriatr Gerontol Int*. 2017 Jun;17(6):984-990. doi: 10.1111/ggi.12821. Epub 2016 Jun 10. [Co-author]
10. Chang BS, Jung JH, **Park SM**, Lee SH, Lee CK, Kim H. Structural Femoral Shaft Allografts for Anterior Spinal Column Reconstruction in Osteoporotic Spines. *Biomed Res Int*. 2016 2016:8681957. [Co-author]
9. Jung HS, **Park SM**, Kim GU, Kim MK, Song, KS. Unique Imaging Features of Spinal Neurenteric Cyst: Case Report and Review of the Literature. *Clin Orthop Surg*. 2015 Dec;7(4):515-18. [Co-author]
8. Ko YB, Jang EC, **Park SM**, Kim SH, Kwak YH, Lee HJ. No Difference in Clinical and Radiologic Outcomes after Total Knee Arthroplasty with a New Ultra-Congruent Mobile Bearing Systems and Rotating Platform Mobile Bearing Systems after Minimum 5-Years Follow-Up. *J Arthroplasty*. 2015 Mar;30(3):379-83. [Co-author]
7. **Park SM**, Lee JS, Jung JY, Kim JY, Song KS. How Should Anteromedial Coronoid Facet Fracture Be Managed? A Surgical Strategy Based on O'Driscoll Classification and Ligament Injury. *J Shoulder Elbow Surg*. 2015 Jan;24(1):74-82. [**First author**]
6. Ha YC, Baek JH, Ko YB, **Park SM**, Song SH. High mortality and poor morbidity after hip fracture in patients with previous vertebral fractures. *J Bone Miner Metab*. 2015 Sep; 33(5):547-52. [Co-author]
5. Oh JH, Kim JY, Choi JH, **Park SM**. Is Arthroscopic Distal Clavicle Resection Necessary for Patients With Radiological Acromioclavicular Joint Arthritis and Rotator Cuff Tears? A Prospective Randomized Comparative Study. *Am J Sports Med*. 2014 Nov;42(11):2567-73. [Co-author]
4. **Park SM**, Song KS, Park SH, Kang H, Daniel Riew K. Does whole-spine lateral radiograph with clavicle positioning reflect the correct cervical sagittal alignment? *Eur Spine J*. 2015 Jan;24(1):57-62. [**First author**]
3. **Park SM**, Baek JH, Ko YB, Lee HJ, Park KJ, Ha YC. Management of Acute Calcific Tendinitis around the

Hip Joint. Am J Sports Med. 2014 Nov;42(11):2659-65. **[First author]**

2. Kim H, Baek JH, **Park SM**, Ha YC. Arthroscopic reduction and internal fixation of acetabular fractures. Knee Surg Sports Traumatol Arthrosc. 2014 Apr;22(4):867-70. [Co-author]

1. Song KS, Chaiwat P, Kim HJ, Mesfin A, **Park SM**, Riew KD. Anterior cervical fusion assessment using reconstructed computed tomographic scans: surgical confirmation of 254 segments. Spine (Phila Pa 1976). 2013 Dec 1;38(25):2171-7. [Co-author]

#### **Papers published in domestic (Korean) journals**

9. **Park SM**, Park HJ, Koo KH, Hong JY, Lim ST (K-MISS Study Group). Technical tips for minimally invasive fusion surgery. J Korean Soc Spine Surg. 2023. **[First author]** [Accepted]

8. **Park SM**, Youn MS, Kim JE, Suh SP, Park JS, Lim ST (K-MISS Study Group). Minimally invasive surgical techniques in revision spine surgery. J Korean Soc Spine Surg. 2023. **[First author]** [Accepted]

7. Park HJ, Choi JY, You KH, **Park SM**, Kang MS, Lee WM. Clinical outcomes of biportal endoscope lumbar discectomy in obese patients: preliminary reports. J Advanced Spine Surgery. 2022 Dec;12(2):60-69. **[Corresponding author]**

6. **Park SM**, Go SJ, Han H, Kim HJ, Kim H, Chang BS, Yeom JS. Medical Care Utilization Behavior for Diagnosis and Treatment for Spine disease: A Questionnaire-based Study of Orthopaedic Spine Center Outpatients at a Tertiary Educational Hospital. J Korean Soc Spine Surg. 2020 Mar;27(1):19-25. **[First author]**

5. Park JW, **Park SM**, Lee CK, Chang BS, Chang SY, Kim H. Percutaneous pedicle screw fixation in spinal metastasis: A preliminary study. J Advanced Spine Surgery. 2019 Jun;9(1):7-13. [Co-author]

4. **Park SM**, Kim HJ, Yeom JS, Shin YG. Spine Surgery Using Augmented Reality. J Korean Soc Spine Surg. 2019 Mar;26(1):16-22. **[First author]**

3. **Park SM**, Kim H, Ha JH, Lee SJ, Kim HJ, Yeom JS, Lee CK, Chang BS. Spinal instability neoplastic score (SINS) influencing surgical decision making for treatment of spine metastasis. J Korean Soc Spine Surg. 2018 Jun;25(2):60-68. **[First author]**

2. **Park SM**, Jung JH, Lee CK, Kim H, Chang BS. Spinopelvic Reconstruction with Femoral Allograft and vertical Rectus Abdominis Myocutaneous Flap after Total Sacrectomy in Recurrent Sacral Chordoma. J Korean Soc Spine Surg. 2016 Jun;23(2):114-21. **[First author]**

1. **Park SM**, Song KS, Park SH. Comparison of Cervical Static Sagittal Alignment: Whole-Spine Lateral Radiograph and Cervical Lateral Radiograph (Preliminary Report). J Advanced Spine Surgery. 2013 Dec;3(2):59-63. **[First author]**

#### **Conference Presentation (International)**

16. Lee J, Kim Y, Yang JJ, Chang DG, **Park SM**, Song KS. Postoperative Analgesic Effectiveness of Single Ropivacaine Epidural Injection in Patients Underwent One-level Lumbar Decompression or Fusion Surgery: A Randomized, Multi-center Study. The 2021 ISASS Annual Conference, Miami, USA, May 13-15, 2021

15. **Park SM**, DW Ham, Kim HJ, Yeom JS. Biportal endoscopic versus microscopic lumbar decompressive laminectomy in patients with spinal stenosis: A randomized controlled trial. The 2021 ISASS Annual Conference, Miami, USA, May 13-15, 2021

14. **Park SM**, Kim HJ, Yeom JS. Biportal endoscopic versus microscopic lumbar decompressive laminectomy in patients with spinal stenosis: A randomized controlled trial. The 20<sup>th</sup> Pacific and Asian Society of Minimally Invasive Spine Surgery, Seoul. Korea, April 1-3, 2021

13. **Park SM**, Kim HJ, Yeom JS, Chang BS. Incidence and mortality of subsequent vertebral fractures: analysis of claims data of the Korea National Health Insurance Service from 2007 to 2016. 2020 Annual Eurospine Meeting & congress. Virtual congress, Vienna, Austria, October 7-9, 2020



12. **Park SM**, Kim HJ, Yeom JS, Chang BS. Is regular walking associated with a lower risk of low back pain?: A cross-sectional study using the Korean National Health and Nutritional Surveys. 2020 Annual Eurospine Meeting & congress. Virtual congress, Vienna, Austria, October 7-9, 2020

11. **Park SM**, Kim HJ, Yeom JS, Chang BS. Biportal endoscopic versus microscopic lumbar decompressive laminectomy in patients with spinal stenosis: A randomized controlled trial. 2020 Annual Eurospine Meeting & congress. Virtual congress, Vienna, Austria, October 7-9, 2020

10. Song KS, **Park SM**. Multiple anterior bridging bone using newly designed anterior bridging cage (ABC) in posterior lumbar interbody arthrodesis. NASS 2019 34th Annual Meeting. Chicago, IL, USA, September 25-28, 2019

9. **Park SM**, Jung JH. How many screws are necessary to be considered an experienced surgeon for freehand placement of thoracolumbar pedicle screws? Analysis of the learning curve using the cumulative summation test for learning curve (LC-CUSUM). NASS 2019 34th Annual Meeting. Chicago, IL, USA, September 25-28, 2019

8. **Park SM**, Jung JH. Is regular walking associated with a lower risk of low back pain?: A cross-sectional study using the Korean National Health and Nutritional Surveys. NASS 2019 34th Annual Meeting. Chicago, IL, USA, September 25-28, 2019

7. **Park SM**, How many screws are necessary to be considered an experienced surgeon for freehand placement of thoracolumbar pedicle screws? Analysis of the learning curve using the cumulative summation test for learning curve (LC-CUSUM). 2019 12th Combined Meeting of Asia Pacific Spine Society & Asia Pacific Paediatric Orthopaedic Society. Songdo, Korea, April 4-6, 2019

6. **Park SM**, Seo J, Kim HJ, Yeom JS. Learning curve of lumbar decompressive laminectomy in biportal endoscopic spinal surgery (BESS) using the cumulative summation test for learning curve (LC-CUSUM). 2018 Annual Eurospine Meeting & congress. Barcelona, Spain, September 19-21, 2018

5. **Park SM**, Chang BS, Kim HJ, Yeom JS. Is Redo Vertebroplasty an Effective Treatment on the Same Vertebra? 2018 Annual Eurospine Meeting & congress. Barcelona, Spain, September 19-21, 2018

4. Chang BS, **Park SM**, Lee HJ, Park JW, Zheng GB, Kim H, Lee CK. Single Hemivertebra: Does It Has Spontaneous Remodeling Potential? 51<sup>st</sup> SRS Annual Meeting & Course. Prague, Czech Republic, September 21-24, 2016

3. Chang BS, **Park SM**, Lee HJ, Park JW, Zheng GB, Kim H, Lee CK. Does Percutaneous Vertebroplasty for Vertebral Compression Fracture with Intravertebral Cleft Vertebral Body Height? Spineweb 2016. Singapore, May 16-20, 2016

2. Lee HJ, **Park SM**, Ko YB, Kwak YH. UKA Revision under Navigation System. AAOS Annual Meeting 2015. Las Vegas, March 24-28, 2015.

1. Oh JH, Kim JY, Choi JH, **Park SM**. Is Distal Clavicle Resection Necessary for Patients with Radiologic Acromioclavicular Joint Arthritis and Rotator Cuff Tear? AAOS Annual Meeting 2014. New Orleans, March 11-14, 2014.

#### Conference Presentation (Domestic)

43. Na SS, **Park SM**, Kim HJ, Yeom JS. Are vertebroplasty combined with foraminotomy or with decompression effective in the treatment of persistent pain that in lumbar compression fracture? The 40th International Congress of Korean Society of Spine Surgery, KSSS 2023. Seoul, Korea. May 26 (Fri), 2023

42. Kwon O, **Park SM**, Kim HJ, Yeom JS. Clinical outcomes of surgical debridement only in pyogenic spondylitis. The 40th International Congress of Korean Society of Spine Surgery, KSSS 2023. Seoul, Korea. May 26 (Fri), 2023

41. Kim C, **Park SM**, Lee S, Lee D. AI model for CT and MRI harmonization from multi-vendor images. 2023 Winter Conference of Society for Computational Design and Engineering. Pyeongchang, Korea. Feb 10 (Fri), 2023.

40. Kim C, **Park SM**, Lee D. Intensity standardization of multi-vendor MRI-a preliminary study. 2022 KSIAM Annual Meeting. Jeju, Korea. Nov 24 (Thu), 2022.
39. **Park SM**, Kwon O, Kim HJ, Yeom JS. Clinical outcomes of surgical debridement only in pyogenic spondylitis. The 22nd Congress of Korean Society for the Advancement of Spine Surgery. Seoul, Korea. Nov 12 (Sat), 2022
38. **Park SM**, Kim HJ, Yeom JS. Biportal Endoscopic versus Microscopic Discectomy for Lumbar Herniated Disc: A Randomized Controlled Trial. The 21st Congress of Korean Society for the Advancement of Spine Surgery. Seoul, Korea. Jun 25 (Sat), 2022
37. **Park SM**, Lee HJ, Kim HJ, Yeom JS. Biportal Endoscopic versus Microscopic Discectomy for Lumbar Herniated Disc: A Randomized Controlled Trial. The 3rd International Congress of Korean Society of Spine Surgery, KSSS 2022. Seoul, Korea. May 27 (Fri), 2022
35. **Park SM**, Kwon BT, Kim HJ, Yeom JS. The feasibility and safety of a CaO-SiO<sub>2</sub>-P<sub>2</sub>O<sub>5</sub>-B<sub>2</sub>O<sub>3</sub> bioactive glass ceramic spacer compared to polyetheretherketone cage in posterior lumbar interbody fusion and fusion performed using: A prospective randomized controlled trial. The 3<sup>rd</sup> International Congress of Korean Society of Spine Surgery, KSSS 2022. Seoul, Korea. May 27 (Fri), 2022
34. **Park SM**, Kim HJ, Yeom JS. The feasibility and safety of a CaO-SiO<sub>2</sub>-P<sub>2</sub>O<sub>5</sub>-B<sub>2</sub>O<sub>3</sub> bioactive glass ceramic spacer compared to polyetheretherketone cage in posterior lumbar interbody fusion and fusion performed using: A prospective randomized controlled trial. The 20th Congress of Korean Society for the Advancement of Spine Surgery. Seoul, Korea. Dec 4 (Sat), 2021
33. Kwon BT, **Park SM**, Kim HJ, Yeom JS. Comparison of the therapeutic effects of teriparatide and denosumab in osteoporotic vertebral fractures. The 38th Fall Congress Korean Society of Spine Surgery. Busan, Korea. Nov 19 (Fri), 2021
32. **Park SM**, Kim DJ, Kim HJ, Yeom JS. Augmented reality assisted spine surgery for pedicle screw fixation. The 65th Spring Congress of the Korean Orthopaedic Association, Korea. July 9 (Fri), 2021
31. **Park SM**, Kim HJ, Yeom JS. Augmented Reality-Guided Pedicle Screw Fixation: An Experimental Study. International Congress of Korean Society of Spine Surgery, KSSS 2021. Seoul, Korea. May 28 (Fri), 2021
30. **Park SM**, Lee YK, Kim HJ, Yeom JS, Koo KH. Risk factors for subsequent vertebral fractures following a previous hip fracture. The 8th Seoul Symposium on Bone Health. Seoul, Korea. Nov 13 (Fri), 2020
29. **Park SM**, Lee YK, Kim HJ, Yeom JS, Koo KH. Risk factors for subsequent vertebral fractures following a previous hip fracture. The 37th Fall Congress Korean Society of Spine Surgery. Seoul, Korea. Nov 13 (Fri), 2020
28. Kim HJ, **Park SM**, Kwon O, Han H, Kim JG, Yeom JS. Improvement in gait pattern and its relationship with preoperative pelvic compensation after surgery in patients with sagittal plane deformity. The 64th Annual Congress of the Korean Orthopaedic Association. Oct 15, 2020
27. **Park SM**, Kim HJ, Yeom JS. Trends of Incidence and Mortality of Vertebral Fractures in Korea. International Congress of Korean Society of Spine Surgery, KSSS 2020. Seoul, Korea. Aug 3 (Mon), 2020
26. **Park SM**, Kim HJ, Yeom JS, Chang BS, Lee CK. How many screws are necessary to be considered an experienced surgeon for freehand placement of thoracolumbar pedicle screws? Analysis of the learning curve using the cumulative summation test for learning curve (LC-CUSUM). The 17th Congress of Korean Society for the Advancement of Spine Surgery. Seoul, Korea. Nov 16 (Sat), 2019
25. **Park SM**. Bi-Portal Endoscopic Spinal Surgery (Lumbar decompression). Discussion Panel of Live surgery. The 63rd Annual Congress of the Korean Orthopaedic Association. Oct 19, 2019
24. **Park SM**, Lee YK, Ha YC, Jang S, Kim HY. Trends of incidence and fatality of vertebral fractures in Korea using nationwide claims data. The 7th Seoul Symposium on Bone Health. May 30 - June 1, 2019
23. **Park SM**, Kim HJ, Yeom JS, Lee YK, Jang S, Kim HY. Trends of incidence and fatality of subsequent vertebral fractures in Korea using nationwide claims data. The 36th Spring Congress Korean Society of Spine Surgery. May 24-25, 2019

22. **Park SM**, Kim HJ, Yeom JS, Chang BS, Lee CK. How many screws are necessary to be considered an experienced surgeon for freehand placement of thoracolumbar pedicle screws? Analysis of the learning curve using the cumulative summation test for learning curve (LC-CUSUM). The 36th Spring Congress Korean Society of Spine Surgery. May 24-25, 2019
21. **Park SM**, Kim HJ, Yeom JS, Chang BS, Lee CK. Unilateral laminectomy and bilateral decompression of lumbar central stenosis with biportal endoscopic versus mini-open microscopic technique: An analysis of a prospective randomized controlled trial. The 36th Spring Congress Korean Society of Spine Surgery. May 24-25, 2019
20. **Park SM**, Kim HJ, Yeom JS, Chang BS, Lee CK. Walking more than 90 minutes/week was associated with a lower risk of self-reported low back pain in persons over 50 years of age: A cross-sectional study using the Korean National Health and Nutrition Examination Surveys. The 36th Spring Congress Korean Society of Spine Surgery. May 24-25, 2019
19. **Park SM**, Park JW, Kim H. Percutaneous pedicle screw fixation for palliative surgery in spinal metastasis. The annual spring symposium of the research society of minimally invasive spine surgery. April 13 (Sat), 2019
18. **Park SM**, Jang S, Kim HJ, Yeom JS. Longer sitting time and low physical activity are closely associated with chronic low back pain in population over 50 years of age: a cross-sectional study using national health survey. The 62nd annual Congress of the Korean Orthopaedic Association. Oct 18, 2018
17. **Park SM**. Learning curve of lumbar decompressive laminectomy in biportal endoscopic spinal surgery (BESS) using the cumulative summation test for learning curve (LC-CUSUM). The annual fall symposium of the research society of minimally invasive spine surgery. Oct 6 (Sat), 2018
16. **Park SM**, Kim HJ, Yeom JS, Chang BS, Lee CK. Unilateral laminectomy and bilateral decompression of lumbar central stenosis with biportal endoscopic versus mini-open microscopic technique: preliminary results of a prospective randomized controlled study. The 35th Spring Congress Korean Society of Spine Surgery. June 1(Fri), 2018
15. **Park SM**, Kim HJ, Yeom JS, Chang BS, Lee CK. Learning curve of lumbar decompressive laminectomy in biportal endoscopic spinal surgery (BESS) using the cumulative summation test for learning curve (LC-CUSUM). The 35th Spring Congress Korean Society of Spine Surgery. June 1(Fri), 2018
14. **Park SM**, Kim HJ, Yeom JS, Chang BS, Lee CK. Depression is closely associated with chronic low back pain in patients over 50 years of age: a cross-sectional study using the sixth Korea National Health and Nutrition Examination Survey (KNHANES VI-2). The 35th Spring Congress Korean Society of Spine Surgery. June 1(Fri), 2018
13. **Park SM**, Chang BS, Lee CK, Kim H, Kim HJ, Yeom JS. Is Repeat Vertebroplasty an Effective Treatment in Previously Cemented Vertebrae? The 34th Spring Congress Korean Society of Spine Surgery. May 14(Fri), 2017
12. Kim H, Lee CK, Chang BS, Lee HJ, **Park SM**, Park JW, Kim SM. Usefulness of intraoperative neuromonitoring in three-column-involving spine surgery. The 33rd Spring Congress Korean Society of Spine Surgery. May 27(Fri), 2016
11. Chang BS, Lee CK, Kim H, **Park SM**, Park JW, Lee YJ. Does Percutaneous Vertebroplasty for Vertebral Compression Fracture with Intravertebral Cleft Vertebral Body Height? The 59th annual Congress of the Korean Orthopaedic Association. Oct 18, 2015
10. Lee HJ, **Park SM**, Ko YB. UKA Revision under Navigation System. The 58th annual Congress of the Korean Orthopaedic Association. Oct 16, 2014
9. Song KS, Kang KS, **Park SM**, Kim GU. Does Whole-Spine Lateral Radiograph Reflect Correct Cervical Alignment? The 31st Spring Congress Korean Society of Spine Surgery. May 22(Fri), 2014
8. Ha YC, **Park SM**, Lee HJ. Fate of Acute Calcific Tendinitis around the Hip Joint. The 2014 Spring Congress Korean Orthopedic Society for Sports Medicine. April 18(Fri), 2014
7. Song KS, Jeong HS, **Park SM**. Unique imaging feature of spinal neurenteric cyst. The 3rd Spring Congress Korean Society of Spine Tumor. March 22(Fri), 2014

6. Song KS, Kang KS, **Park SM**, K. Daniel Riew. The Accuracy of Radiographic Modalities for Evaluating Anterior Cervical Fusion status: Dynamic Radiographs and CT scan. The 57th annual Congress of the Korean Orthopaedic Association. Oct 17, 2013
5. Song KS, Kang KS, **Park SM**. Does Whole-Spine Lateral Radiograph Reflect Correct Cervical Alignment? The 57th annual Congress of the Korean Orthopaedic Association. Oct 17, 2013
4. Kim JH, Jang EC, **Park SM**. Anomalous Course of Superficial Peroneal Nerve in Distal Fibular Fracture. The 23rd Annual Fall Congress and Symposium of Korean Foot and Ankle Society and combined symposium with European Foot and Ankle Society. Oct 17, 2013
3. **Park SM**, Jeong HS, Jang EC, Kwak BG. Exercised-induced hyperthermia of Achilles tendon. The 23rd Annual Fall Congress and Symposium of Korean Foot and Ankle Society and combined symposium with European Foot and Ankle Society. Oct 17, 2013
2. Kang SY, Lee JS, **Park SM**. Anteromedial Facet Fractures of the Coronoid Process. The 39th annual Congress of the Korean Fracture Society. April 26, 2013
1. Jang EC, **Park SM**, Kwak BG. Temperature change detected by infrared thermography on Achilles tendon during one-legged hopping. The 56th annual Congress of the Korean Orthopaedic Association. Oct 18, 2012

#### **Lectures and Talks in International or Domestic (Nation-wide) Conferences**

43. AR-assisted pedicle screw fixation. ISASS AP 2023. Seoul, Korea. Aug 18 (Fri), 2023
42. Endoscopic lumbar interbody fusion. AO Spine Advanced Seminar: "Deep Dive to Spinal Fusion". Seoul, Korea. July 8 (Sat), 2023
41. Endplate preparation during UBE lumbar fusion. International World UBE symposium. Seoul, Korea. July 7 (Fri), 2023
40. Robotics and augmented-reality assisted MIS surgery. The 40th International Congress of Korean Society of Spine Surgery, KSSS 2023. Seoul, Korea. May 26 (Fri), 2023
39. Practical surgical technique of biportal endoscopic decompression. SPINEWEEK 2023. Melbourne, Australia. May 2 (Tue), 2023
38. Present & future of endoscopic decompression and fusion surgery. The annual spring symposium of the research society of Korean Minimally Invasive Spine Surgery. Ansan, Korea. April 8 (Sat), 2023
37. Endoscopic discectomy indication, pearls, and pitfalls. 2023 The 4th Annual Symposium of the Millitary Medicine. Seongnam, Korea. March 24 (Fri), 2023.
36. Biportal endoscopy in lumbar spine. 2023 Instructional Course Lecture of Korea University Ansan Hospital Orthopaedic Surgery. Seoul, Korea. March 18 (Sat), 2023.
35. Biportal endoscopy. 2023 Instructional Course Lecture of Korea University Guro Hospital Orthopaedic Surgery. Seoul, Korea. March 4 (Sat), 2023.
34. Basic sharing point of BESS: Basic setting and principles. 2023 the 1st K-MISS-ESS symposium. Seoul, Korea. Feb 18 (Sat), 2023.
33. Regrowth of Metastatic Cancer after Surgery. 2023 Seoul National University Bundang Hospital Spine Center, The 14th Symposium. Seongnam, Korea. Feb 4, 2023
32. Biportal endoscopic surgery in lumbar disease. 2023 Instructional Course Lecture of Eulji University Hospital. Seoul, Korea. Jan 29 (Sun), 2023.
31. Biportal endoscopy. 2023 Spine Instructional Course Lecture of Korean Society of Spine Surgery. Seoul, Korea. Jan 29 (Sun), 2023.
30. Regrowth of spine metastasis after surgery. 2022 Korean Society of Spine Tumor Case Discussion. Seoul, Korea. Dec 16 (Fri), 2022

29. Lumbar biportal endoscopic central decompression. The 39th Fall Congress Korean Society of Spine Surgery. Gwangju, Korea. Nov 18 (Fri), 2022
28. Augmented Reality Assisted Spine Surgery. The 39th Fall Congress Korean Society of Spine Surgery. Gwangju, Korea. Nov 18 (Fri), 2022
27. Biportal endoscopy for lumbar herniated disc. 2022 Asan Spine Symposium. Sep 23 (Fri), 2022
26. Direct decompression is still mainstay!: MI-TLIF, the ordinary manner. The annual fall symposium of the research society of Korean Minimally Invasive Spine Surgery. Gwangju, Korea. Sep 3 (Sat), 2022
25. AR-Assisted Spine Surgery. The 21st Congress of Korean Society for the Advancement of Spine Surgery. Seoul, Korea. Jun 25 (Sat), 2022
24. Biportal endoscopic surgery for central stenosis. 2022 CHA Orthopaedic Surgery Update. Seoul, Korea. June 19 (Sun), 2022.
23. Prepare reference using EndNote, Figure, and Table for paper. 2022 Seoul National University Orthopedic Surgery Paper Symposium. Seongnam, Korea. June 11, 2022
23. Minimally invasive surgery in spine tumor. 2022 Instructional Course Lecture of Korea University Guro Hospital Orthopaedic Surgery. Seoul, Korea. March 27 (Sun), 2022.
22. Biportal endoscopic surgery for central stenosis. 2022 Spine Instructional Course Lecture of Korean Society of Spine Surgery. Seoul, Korea. Jan 23 (Sun), 2022.
21. Complication of biportal endoscopic spine surgery. HUMC Kangnam Orthopedics Update 2022. Seoul, Korea. Jan 15 (Sat), 2022
20. What is better for adjacent segment pathology: MI DLIF/OLIF vs Open posterior fusion. The 38th Fall Congress Korean Society of Spine Surgery. Busan, Korea. Nov 19 (Fri), 2021
19. Complication of Biportal Endoscopic Spine Surgery. Global Spine Congress 2021. Paris, France. Nov 6 (Sat), 2021
18. Epidemiology of second fracture and fracture liaison service. The 65th Spring Congress of the Korean Orthopaedic Association, Korea. July 8 (Tue), 2021
17. Biportal endoscopic spine surgery in spinal stenosis. The 3rd IASGO/Luzhou Minimally Invasive Spine Summit. Luzhou, China, July 23-25 (Fri), 2021
16. Lumbar Plexus & Ureter Injury. International Congress of Korean Society of Spine Surgery, KSSS 2021. Seoul, Korea. May 28 (Fri), 2021
15. Concept and Evidence Review of Separation Surgery. The 20th Pacific and Asian Society of Minimally Invasive Spine Surgery, Seoul. Korea, April 1-3, 2021
14. Biportal endoscopic spine surgery – Lumbar posterior approach. HUMC Kangnam Orthopedics Update 2021. Seoul, Korea. Jan 16 (Sat), 2021
13. Biportal endoscopy. 2020 SNU Orthopaedic Update (III). Seoul, Korea. Dec 6 (Sun), 2020
12. Biportal Endoscopic Lumbar Spine Surgery. The 18th Congress of Korean Society for the Advancement of Spine Surgery. Seoul, Korea. Nov 21 (Sat), 2020
11. Application of Augmented Reality in Orthopaedic Surgery. VR & AR Technology in Medicine. Seoul, Korea. Nov 19 (Tue), 2020
10. Unilateral laminectomy and bilateral decompression of lumbar central stenosis with biportal endoscopic versus mini-open microscopic technique: An analysis of a prospective randomized controlled trial. The 37th Fall Congress Korean Society of Spine Surgery. Seoul, Korea. Nov 13 (Fri), 2020
9. Complications of endoscopic spinal surgery. 2020 Seoul National University Bundang Hospital Spine Center, The 12th Symposium. Seongnam, Korea. Jan 11, 2020
8. Endoscopic decompression is acceptable, but endoscopic fusion is still controversial. The 17th Congress of

Korean Society for the Advancement of Spine Surgery. Seoul, Korea. Nov 16 (Sat), 2019

7. Biportal endoscopy for lumbar spine. 2019 SNU Orthopaedic Update (III). Seoul, Korea. Aug 11 (Sun), 2019

6. Biportal endoscopic spine surgery in spinal stenosis. The 2nd IASGO/Luzhou PostGraduate Course in "Spinal, traumatic orthopedics, osteoporosis and HBP disease treatment and research" Luzhou, China, July 6 (Sat), 2019

5. Spectrum of osteoporosis related research using national claim database. The 7th Seoul Symposium on Bone Health. May 31 (Fri), 2019

4. Secondary fracture of osteoporotic spine fracture. The 30th Fall scientific congress of Korean Society for Bone and Mineral Research. Seoul, Korea. Nov 17 (Sat), 2018

3. Pictorial review of spinal cord tumor. The 35th Fall Congress Korean Society of Spine Surgery. Seoul, Korea. Nov 16 (Fri), 2018

2. How to manage osteoporotic vertebral compression fracture. The Chung-Ang University Orthopedic Symposium. Seoul, Korea. June 10, 2018

1. How to draw graph? 2018 Seoul National University Orthopedic Surgery Paper Symposium. Seongnam, Korea. April 14, 2018

### **Textbook**

1. General assessment and physical examination, Orthopaedics for medical students. 4<sup>th</sup> ed. Koonja, 2022.

### **Good Clinical Practice (GCP)**

The Training Course for Good Clinical Practice. Seoul National University Bundang Hospital Center for Human Research Protection Program. Jun 21, 2022

The Training Course for Good Clinical Practice. Seoul National University Bundang Hospital Center for Human Research Protection Program. March 31, 2021

The Training Course for Good Clinical Practice. Seoul National University Bundang Hospital Center for Human Research Protection Program. May 29, 2020

The Training Course for Good Clinical Practice. Seoul National University Bundang Hospital Center for Human Research Protection Program. March 20, 2019

The Training Course for Good Clinical Practice. Seoul National University Bundang Hospital Center for Human Research Protection Program. March 09, 2018

The Collaborative Institutional Training Initiative (CITI) Program for Clinical Trials with Drugs and Medical Devices. March 2, 2017

### **National Research Project**

Evaluation of the efficacy and safety of conventional and minimally invasive endoscopic spine surgery to treat lumbar spinal stenosis and herniated intervertebral disc: A prospective, randomized, Assessor blind, multicenter trial, Korea Health Industry Development Institute, Ministry of Health and Welfare. Dec. 18. 2020 ~ Dec. 31. 2024 [Principal investigator]

Development of a training system to treat severe trauma based on XR, National IT Industry Promotion Agency, Ministry of Science and ICT. Aug. 1. 2020 ~ Dec. 31. 2022 [Principal investigator]

Development of a spinal surgery robot system based on stereo X-ray and 3D endoscopic guidance, Ministry of Trade, Industry and Energy. May. 1. 2020 ~ Dec. 31. 2024 [Co-researcher]

Medical Digital Twin Generation and 3D Simulation Technology for Prediction and Computer Aided Diagnosis of Musculoskeletal Disease, Institute of Information & communications Technology Planning & Evaluation, Ministry of Science and ICT. Mar. 1. 2018 ~ Dec. 31. 2020 [Co-researcher]

Development of AR-based Surgery Toolkit and Applications, Institute of Information & communications Technology Planning & Evaluation, Ministry of Science and ICT. Sep. 1. 2017 ~ Dec. 31. 2020 [Co-researcher]

### **Patent**

1020378820000 (2019.10.23) for “Needle Assembly for Vertebrae Plasty” in Korea

1020180131998 (2018.10.31) for “Intervertebral fusion implant cage” in Korea

### **Technology transfer**

Scenario of AR-Assisted Spine Surgery. 2022.07

Scenario of XR (eXtended Reality) based Trauma Treatment Training. 2021.02