Contents

Section 1: Basic Considerations

1. Clinical Anatomy of Subaxial Cervical Spine 3
R Selvan

- Cervical Spine *3*
- Intervertebral Disc *4*
- Ligaments *4*
- Bony Cervical Spinal Canal *4*
- Spinal Cord *4*
- Nerve Roots *5*
- Vertebral Artery *5*
- Musculature *5*
- Mobility of the Cervical Spine *6*
- Movements in the Cervical Spine *6*
- Flexion/Extension *6*
- Lateral Bending *6*
- Anatomical Considerations of Unco-vertebral Joints *6*

2. Applied Anatomy of Cervical Spine 8
Antonio Figueiredo

- Important Root Lesions *8*
- Important Spinal Cord Lesion *8*
- MRC Classification *9*

3. Clinical Biomechanics Related to Cervical Disc Degeneration and Herniation 11
Komal Prasad

- Structural Degradation in the Intervertebral Disc *11*
- Stability *11*
- Segmental Instability *12*
- Ligaments *12*
- Facet Joints *13*
- Pars Interarticularis *14*
- Mobility and Stability *14*
- Effect of Settled Disc Space *15*

4. Genetic Susceptibility of Cervical Disc Herniation 17
SV Rege

- Understanding of Pathogenesis *17*
- Hereditary Predisposition *17*

5. Basic Knowledge of Screws and Plates Used in Anterior Cervical Stabilization Following Excision of Herniated Cervical Disc 19
Brig Harinder S Bhatoe

- Uses of Screws in Cervical Spine *19*
- Components of Screw *19*
- Types of Screws *19*
- Advantages *21*

- Indications *21*
- Plates *21*
- Screws *21*
- Procedure *22*
- Bicortical Purchase *23*

Section 2: Applied Considerations

6. Safe Anterior Approach to Subaxial Cervical Spine 27
PS Ramani, Sudhendoo Babhulkar
- Operative Steps *30*

7. Safe Posterior Approach to Subaxial Cervical Spine 38
PS Ramani, Sumeet G Pawar
- Advantages *38*
- Disadvantages *38*
- Basic Knowledge *38*
- Anesthesia *39*
- Position of the Patient *39*
- Exposure *40*
- Closure *40*
- Controversy *40*
- Complications *41*
- Mobilization *42*

8. Technique of Harvesting Bone Grafts from the Anterior and Posterior Iliac Crest 43
Yashbir Dewan, Sanjeev Dua
- Anterior Iliac Crest *43*
- Posterior Iliac Crest *45*

9. Evolution of Surgical Management of Cervical Disc Herniation 48
PD Kulkarni
- Scientific Beginning *48*
- Modern Surgery 49
- Robinson and Smith (1954) *49*
- RB Cloward (1958) *50*
- Mayfield's Contribution *50*
- Discectomy without Fusion *51*
- Justification for Anterior Approach *51*
- Universal Support for Anterior Approach *51*
- Minimally Invasive Spinal Surgery (MISS) for Herniated Cervical Discs *52*

Section 3: Surgical Techniques

10. Single Level Anterior Cervical Discectomy without Fusion: An Outcome Analysis 57
Abbas Amirjamshidi, Kourosh Karimi Yarandi, Kazem Abbassioun
- Variations in Surgical Technique *58*
- Long-term Outcome of Graftless Fusion *58*
- Different Variables Evaluated as the Outcome Measures *58*
- Outcome Evaluation by Imaging *61*
- Complications *62*
- Improvement and Recurrence *63*
- Comparison between ACD and Fusion Techniques *64*

- Adjacent Segment Degeneration *68*
- Complications and Morbidities 68

11. Long-term Outcome of Herniated Cervical Disc Excision without Fusion (ACD) 73
Prakash G Modha, Kartik S Modha

- Historical Background *73*
- Advantages and Disadvantages *73*
- Material and Methods *73*
- Ideal Patients *74*
- Surgical Technique *74*
- Revision Surgery *75*

12. Cervical Interbody Fusion with Bone Graft 78
Abdul Hafid Bajamal, Eko Agus Subagio, Muhammad Faris

- Indication for Surgery *78*
- Advantages *78*
- Preoperative Planning *78*
- Positioning the Patient *79*
- Surgical Procedure *79*
- Graft Source *81*
- Graft Donor Site Preparation *81*
- Postoperative Care *82*
- Complications *82*

13. Use of Autograft for Interbody Fusion Following Anterior Cervical Discectomy 84
JKBC Parthiban

- Autologous Bone Graft and Spinal Fusion *84*
- Alternate Choices *84*
- Radiological Evaluation *85*
- Comparison of Results of Auto- and Allografts in ACDF *86*
- Complications of Donor Site *87*
- Technique of Harvesting Tricortical Iliac Crest Graft *88*
- Graft Placement *88*

14. Advantages and Disadvantages of the Use of Plate for Anterior Cervical Fusion 91
Sushil V Patkar

- Evolution of Implants *91*
- Technique of Anterior Cervical Plating *93*
- Personal Series 1996-2010 *94*
- Literature Evidence *97*

15. Surgical Outcome of Cervical Anterior Fusion Using Hybrid Cage 101
G Kusaka, M Shoda, H Kamochi, M Ishikawa, Y Tanaka, S Kuno, T Inoue

- Material and Methods *101*
- Cervical Hybrid Cage System *101*
- Experimental Evaluation *102*
- Operative Technique *102*
- Clinical Results and Discussion *102*
- Complications *104*

16. Long-term Outcome in Patients with Herniated Cervical Disc Treated with Anterior Cervical Discoidectomy and Fusion Using Dr Ramani's Titanium Fuzer Cages 106
Shradha Maheshwari, PS Ramani

- Fuzer Cages *106*
- Surgical Technique *106*
- Materials and Methods *107*
- Results *107*

- Complications *108*
- Advantages of Fuzer Cages *108*

17. Use of Cage and Plate in the Management of Herniated Cervical Disc Prolapse: Its Advantages and Disadvantages 112
Rahmi Kemal Koç

- Anterior Approach in Cervical Degenerative Disc Diseases *112*
- Surgical Technique *112*
- Complications *118*
- Results *118*

18. Median Corpectomy for Cervical Disc Disease 120
K Sridhar

- Indications *120*
- Imaging *121*
- Surgical Technique *121*
- Fusion *125*
- Stabilization *127*
- Closure *128*
- Functional Outcome *130*
- Personal Experience *130*
- Results *131*

19. Role of Corpectomy in the Surgical Management of Cervical Disc Herniation 134
Marcos Masini

- Material and Methods *135*
- Corpectomy *136*

20. Oblique Corpectomy in the Management of Cervical Disc Disease and Degeneration in the Cervical Spine 140
Cumhur Kilincer, Mehmet Zileli

- Description *140*
- History *140*
- Indications *141*
- Operative Technique *141*
- Problems/Pitfalls *143*
- Illustrative Cases *143*
- Results *143*
- Complications *143*

21. Endoscopic Cervical Discectomy 148
Shibayama Motohide, Ito Fujio, Miura Yasushi, Nakamura Shu, Ikeda Syoji, Taguchi Mitsuto

- Patients and Methods *148*
- Surgical Technique *148*
- Results *149*
- Illustrative Case *149*

22. Anterior Endoscopic Assisted Microdecompression of Cervical Disc and Foramen 152
John C Chiu, Ali M Maziad

- Material *152*
- Method *153*
- Surgical Indications *153*
- Contraindications *153*
- Surgical Procedure *153*
- Postoperative Care *155*

23. Endoscopic Cervical Discectomy with Laser or Radiofrequency 162
Enrique Osorio-Fonseca, Nicolas Prada, Juan Manuel Sierra
- Indications for Endoscopic Cervical Discectomy *162*
- Contraindications *162*
- Surgical Technique *163*
- Postoperative Care *165*
- Complications *168*

24. Cervical Disc Arthroplasty 170
UM Mutter, F Porchet
- History *170*
- Pathophysiology of Degenerative Disc Disease *171*
- Indications *172*
- Contraindications *172*
- Surgical Considerations *173*
- Technical Considerations *173*
- Implants Available *173*
- Surgical Technique *176*
- Complications *177*

25. Cervical Arthroplasty 181
Enrique Klériga, Jesús C Bustamante, Gerardo F Zambito
- Description and History *181*
- Anatomical and Biomechanical Concepts *183*
- Indications for Arthroplasty *184*
- Complications *184*
- Surgical Technique *185*
- Results *186*

26. Cervical Total Disc Replacement with PCM® Device: Experience from 280 Levels in 162 Patients with up to Five Years Follow-up 189
Luiz Pimenta, Leonardo Oliveira, Luis Marchi, Etevaldo Coutinho
- Material and Methods *189*
- Surgical Technique *190*
- Device Description *190*
- Statistical Analysis *191*
- Results *191*
- Clinical Assessment *191*

27. Management of Multiple Cervical Disc Prolapses 197
Tin Fung David Sun, Wai Sang Poon
- Initial Management *197*
- Indication for Operative Treatment *198*
- Surgical Options *199*
- Role of Percutaneous Neuroradiological Intervention *202*
- Comparison between Different Approaches *203*
- Selection of Treatment Option *203*

28. Long-term Effect of Single Level Cervical Fusion on Development of Disc Disease in the Adjacent Levels 211
Abbas Amirjamshidi, Hooshang Saberi, Kazem Abbassioun
- Background *211*
- Pathophysiology *211*

29. Posterior Cervical Microdiscectomy 218
PS Ramani, Sameer Parekh
- Surgical Technique *218*

30. Posterior Cervical Microforaminotomy (Using Minimally Invasive Tube Retractors) 223
Mehmet Zileli
- Indications *223*
- Main Advantage of a Posterior Microforaminotomy *223*
- Disadvantage *223*
- Ideal Patient for Surgery *223*
- Operative Technique 223
- Complications *225*
- Learning Curve *225*
- Outcome *225*

31. Expansive Laminoplasty of the Cervical Spine (For Multilevel Cervical Disc Herniations) 230
Junichi Mizuno
- Introduction *230*
- General Principles *230*
- Indications *230*
- Advantages *231*
- Pitfalls *231*
- Surgical Techniques *231*
- Postoperative Patients' Care *232*

32. Laminoplasty for Cervical Disc Herniations..... 236
Ben Roitberg, Adam G Back
- History of Laminoplasty *236*
- Proposed Advantages of Laminoplasty *237*
- Laminoplasty for Cervical Disc Herniation *237*
- Typical Indications and Procedure *238*
- Contraindications and Limitations *239*
- General Surgical Considerations *239*
- Keeping the Door Open *240*
- Postoperative Management *241*

33. Role of Ozone Therapy in Cervical Disc Herniation..... 246
Marcos Masini, Rogério Safatle, João Flávio G Madureira
- Ozone Therapy *246*
- Results *248*

34. Long-term Results of Surgery for Cervical Disc Disease: Anterior vs Posterior Approaches..... 254
George J Dohrmann, Joseph C Hsieh
- Anterior vs Posterior Approaches *254*
- Introduction *254*
- Patient Selection *254*
- Results *254*

Index..... 259