Cervical Fusion vs. Artificial Disc Replacement (CADR)

Metanalysis of Class I Data on Results of Anterior Cervical Decompression and Fusion

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Materials and Methods:

• This is a metanalysis of all class data available from five FDA IDE studies involving ACDF
The five studies together comprise a sample of 1,154 single-level ACDF patients.

The true results of one level ACDF:

- 10% reoperation rate at two-year follow-up
  - pseudoarthrosis
  - adjacent level degeneration
  - revision
- 70% clinical success

ACF Downsides

- Adjacent level degeneration
- Slow recovery
- Pseudoarthrosis
Radiculopathy and Myelopathy at Segments Adjacent to Previous ACDF

- Symptomatic adjacent level disease has been reported to occur in more than 25% of patients within 8-10 years following ACDF with nearly half requiring re-operation. 
  
  Hilibrand, et al. JBJS 1999; 81(4) 519-28

Hypermobility

- Cervical fusion causes hypermobility of adjacent levels especially the superior motion segment

  Matsmoto et al. ACDF accelerates adjacent level degeneration.

Degeneration

- Cervical ACDF causes accelerated adjacent level degeneration

Anterior Cervical Fusion (ACF):

- Cervical discectomy with interbody fusion is a reasonably successful procedure
- Predictable, reproducible results
- In one-level procedures: class one data indicates an FDA success rate of 70% and a re-operation rate of 10% at two year follow-up.

Desirable Characteristics of Artificial Cervical Discs

- Preservation/restoration of normal ROM
- Multiple level implantation possible
- Better clinical results
- Less re-operations
- Rapid recovery

Kinematics

- C ADR does not alter the adjacent motion level kinematics


Metanalysis of Comparative Outcomes Following Cervical Arthroplasty or Anterior Cervical Fusion

By Paul McAfee, M.D., M.B.A

*Spine*, Vol. 37, No. 11, p 945-952

**Study Design**
- Metanalysis of 4 F.D.A. I.D.E. clinical trials
  - Bryan
  - Prestige
  - Pro-Disc C
  - PCM
- 1,608 patients at 98 sites

**Results**
- Overall Success:
  - Fusion 70.8%
  - C ADR 77.6%  \( p<0.007 \)
- NDI  \( p<0.103 \)
- Neurologic Status  \( p<0.005 \)
- Survivorship  \( p<0.033 \)
Eight year Clinical and Radiological Follow-up of Bryan CADR

**Conclusion**
- At eight year follow-up Bryan CADR maintains favorable clinical and radiological results with preservation of movement and satisfactory clinical outcomes


Five year ProDisc C F.D.A. I.D.E. results

**Conclusion**
- Data shows significant clinical improvement was maintained from 2 year follow-up
- No deterioration of outcomes.
- ProDisc C is safe and effective

Rick Delamarter, M.D.

Conclusions for CADR vs. Fusion

- CADR
  - Faster Recovery
  - Less Re-operations
  - Better Clinical Outcomes
  - Less Adjacent Level Degeneration
  - Similar Cost
Thank You!