

Surgical Management of Low Back Pain

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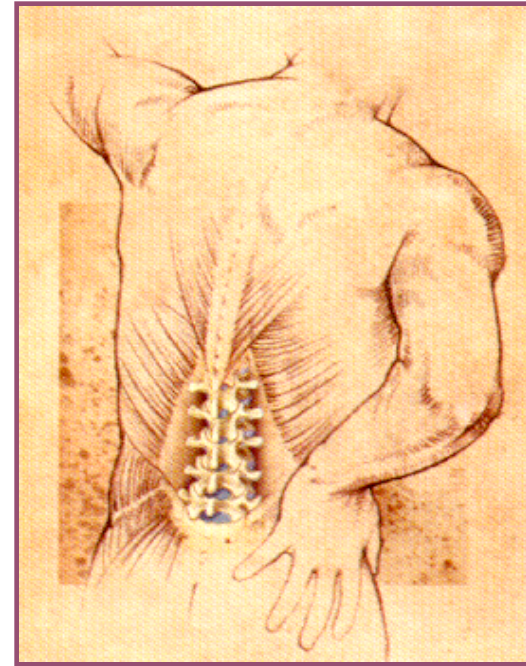
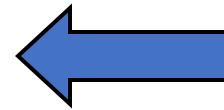
Disclosures

- No financial disclosures



Prevalence of Isolated Back Pain

- 80% lifetime prevalence of back pain
- Annual prevalence of 15-45%
- 5% with chronic symptoms

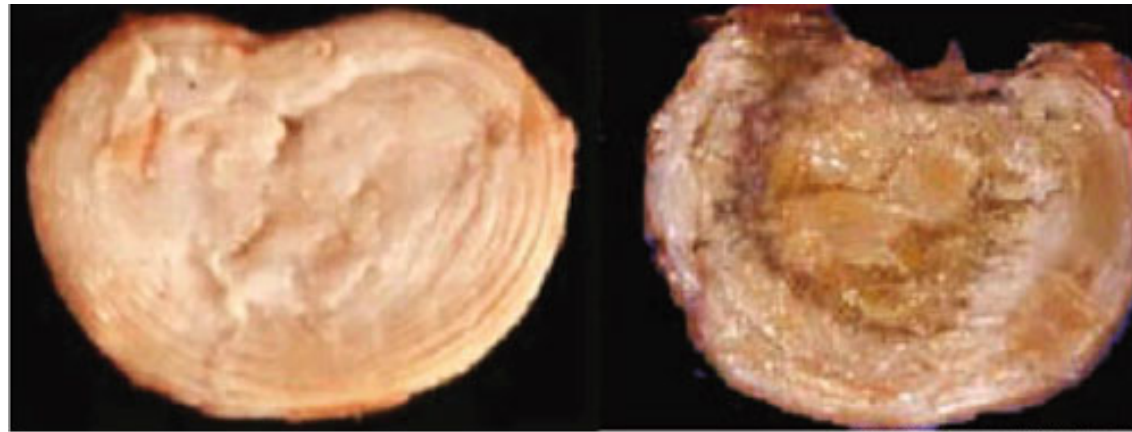


Socio-economic Impact

- Low back pain - #1 impairment leading to time lost from work
- #1 cause of permanent disability
- 50-100 billion \$ per year

Changes With Aging

- Nucleus pulposus – less water content, fewer notochordal cells, less proteoglycan, increased similarity to fibrocartilage
- Annulus fibrosus – increasing disorganization of lamellar structure, radial tears

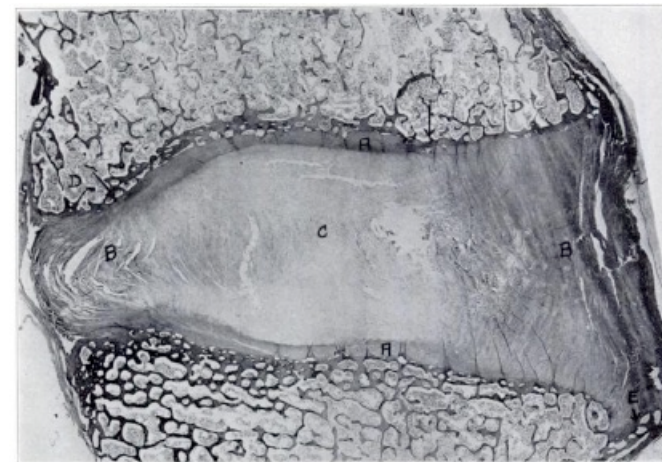
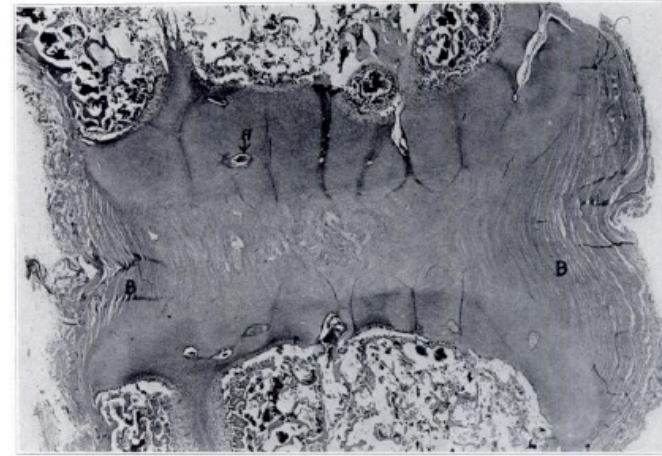


Arthritis Research & Therapy

Urban, et al. Arthritis Res 2004

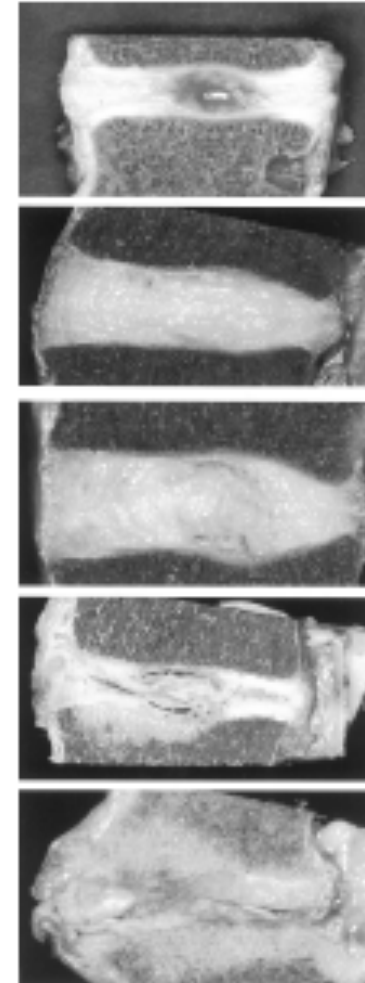
Vascular Supply Changes with Age

- The disc starts with vascular channels and progresses to an avascular state with age
 - 10 months
 - 54 years



Degenerative Changes

- Morphological changes in the disc are followed by the typical changes of degenerative arthritis
 - Osteophyte formation
 - Joint space narrowing
 - Subchondral sclerosis



Age Versus Degeneration

- Degeneration of the intervertebral disc is part of aging
 - **DEGENERATION \neq PAIN**

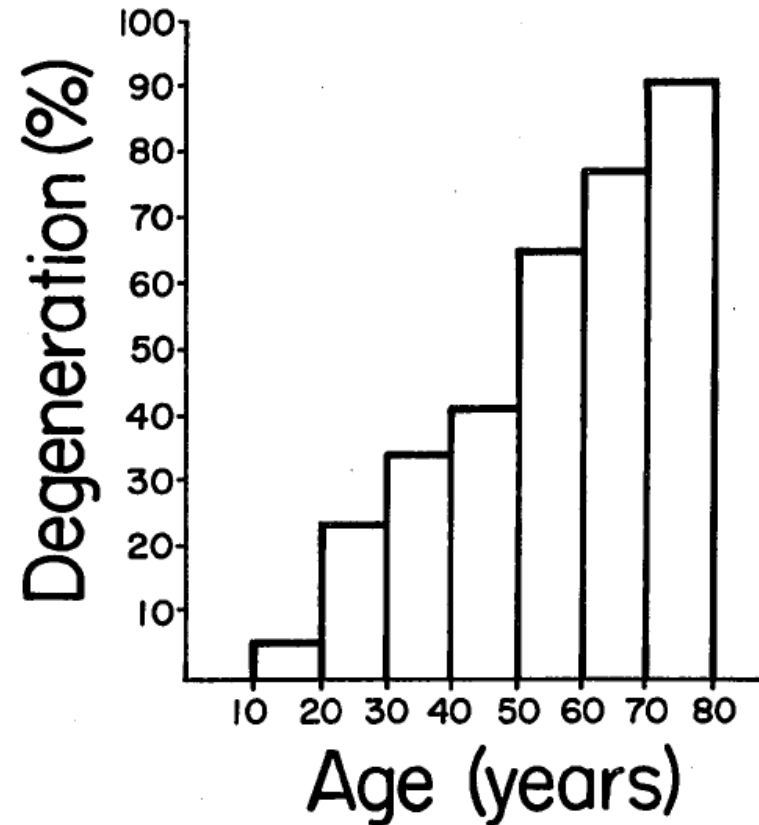


Fig 1. Percent prevalence of degeneration as a function of age.

Why does my back hurt, Doc?



Genetic Factors

Genetic Influences on cervical and lumbar disc degeneration: an MRI study in twins

MRI features of DDD in 172 monozygotic / 154 dizygotic twins

Overall score for disc degeneration – disc height, bulge, osteophytes, signal intensity

Heritability was 74% overall

Results suggest an important genetic component to intervertebral disc degeneration

Twin Studies

- Identical twins with discordant smoking history were analyzed via MRI for evidence of disc degeneration
 - Twinship >> Smoking, Age



ADJUSTED R² VALUES AND SIGNIFICANCE OF TWINSHIP ABOVE AND BEYOND AGE AND SMOKING STATUS FOR EXPLAINING VARIABILITY OF MAGNETIC RESONANCE IMAGES

Finding	R ² with Smoking and Age Variables	R ² with Smoking, Age, and Twinship Variables	P Value for Additional Predictive Value from Twinship
Desiccation of disc			
Anterior			
L1-L4	-0.01	0.59	0.002
L4-S1	0.02	0.55	0.003
Middle			
L1-L4	-0.02	0.42	0.03
L4-S1	-0.01	0.72	<0.001
Posterior			
L1-L4	0.00	0.34	0.053
L4-S1	-0.04	0.61	0.001
Decrease in height of disc space			
L1-L4	-0.05	0.55	0.004
L4-S1	-0.03	0.48	0.02
Bulging or herniation of disc			
L1-L4	0.15	0.54	0.007
L4-S1	-0.04	0.26	0.13

When to give up on conservative management

- Variable
- No strong guidelines
- Greater benefits in more severe cases

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THE PAIN STARTS IN MY HUSBAND'S LOWER BACK,
THEN IT TRAVELS UP HIS SPINE TO HIS NECK,
THEN IT COMES OUT HIS MOUTH AND INTO MY EARS.
AND THAT'S WHY I GET THESE HEADACHES.



When to give up on conservative management

- Surgical indications
 - Progressive neurologic deficits
 - Bowel/bladder dysfunction
 - Intractable pain
 - Failed conservative management

Surgery

- Surgical Options
 - Dependent of patient symptoms, imaging studies, goals of surgery
 - Techniques
 - Laminectomy
 - Laminectomy and fusion
 - MIS techniques
 - Arthroplasty

Surgery

- Surgical Options
 - Dependent of patient symptoms, imaging studies, goals of surgery
 - Approaches
 - Anterior
 - Oblique
 - Lateral
 - Posterior
 - Combined

Questions??