

- 1  *The Gonstead Concept of the Disc*
- 2  *FIRST*  
*A few things to remember about the disc*
- 3  *The human body experiences trauma...*
  - Most of us never get the loads on our spines that Olga got,
  - but then most of us aren't in as good condition...
- 4  *The Disc is pretty important...*
  - Dr. Gonstead felt it was the key to the subluxation...
    - i.e. that the subluxation occurred primarily here, and not at the facets.
- 5  *Disc structure*
  - Recall the structure of the disc:
    - Nucleus is gel like mucopolysaccharide structure
    - Dry weight of only 15% of its wet weight
- 6  *Multiple layers of fibrous rings*
  - fibers of each layer are at approx. 22 deg. to horizontal
  - fibers of adjacent layers are perpendicular to each other
- 7  *Nucleus Pulposis*
  - behaves a bit like a ball-bearing
  - more pronounced in younger, more hydrated discs
  - allows vertebra to pivot above it in various directions
- 8  *Optimum apposition*
  - ideally the endplates should be parallel when optimally positioned
- 9  *Schmorles nodes*
  - Generally considered normal variant - not significant
  - Gonstead saw them as indications of abnormal pressure on the disc
    - indicator of potential subluxation
  - This image shows location of nucleus at posterior portion of vertebra
- 10  *Studies indicate that*
  - early loading on the spine can cause problems...
  - You will see this in your teenage patients
- 11  *The danger of compressive overload at the central joint*
  - is an argument for limiting certain sport activities for the young.
- 12  *Activities such as*
  - powerlifting and gymnastics can cause severe axial (Y axis) compression.

- End-plate invagination and Schmorl's nodes are more likely in the compressed young or nondegenerated disc, because of the prominent, highly pressurized nucleus (19,20).
- 13  *A study by Home et al. (21)*
    - found that competitive water ski jumping leads to a higher incidence of vertebral trauma,
      - including the abnormalities associated with Scheuermann's disease.
  - 14  *Sward et al. (22) showed that*
    - elite male gymnasts had a higher incidence of
      - disc degeneration (evaluated by magnetic resonance imaging, MRT),
      - thoracolumbar abnormalities (e.g., Schmorl's nodes), and
      - back pain.
  - 15  *Jackson et al. (23) found*
    - a history of low-back pain significant enough to disrupt training in 25% of female gymnasts. The mean age of this group was 14 years.
  - 16  *Athletes who subject their spines to extreme axial loads seem to be at risk*
    - Wrestlers (24),
    - football players (25),
    - heavy weight lifters (26),
    - gymnasts (22,24) and other (Figs. 2.13-2.18).
  - 17  *The radiological findings of the study by Sward et al. (24)*
    - suggests both
      - traumatic changes to the motion segments as well as
      - disturbed vertebral growth.
    - Both the age of onset of athletic activity and the degree of mechanical load on the axial skeleton are important factors in the development of these abnormalities.
  - 18  *Nucleus effected by subluxation*
    - a slight displacement of the nucleus can severely reduce some ranges of motion
  - 19  *Disc is a living structure*
    - it needs water
  - 20  *A nucleus pulposus dehydrated from degeneration*
    - is less able to sustain fluid pressure.
      - This decreases the central load on the end-plates during compression and
      - distributes the axial load more peripherally.
  - 21  *A very strong structure*
    - when dealing with axial loads and
    - flexing and extending.
  - 22  *Rotation*
    - produces a situation in which the disc is vulnerable.

- Here is the most common position of injury in the low back.

23  *Subluxation vs. Compensation*

- not every malposition needs to be adjusted

24  *The “Level Disc Theory”*

- The first segment to deviate from level is a subluxation
- The next is a compensation
- alternates up the spine

25  *It should be easy*

- Theoretically, if you clear the first subluxation, the compensations above that should clear also,
- you then would clear the next subluxation, etc.

26  *It doesn't work that way, though.*

- So the level disc theory is considered a bit outdated by most...

27  **GONSTEAD LISTINGS FOR THE INTERVERTEBRAL DISC**

Or: How to save some writing in the ol' soap notes...

28  *Classification of Disc Degeneration*

D1 - D6 discs

29  *Why a classification system?*

- To simplify data entry for soaps and x-rays

30  *Here's how it works...*

31  *D<sub>1</sub>*

- **SWOLLEN DISC**
  - The entire disc is noticeably thickened and swollen from an acute injury.
  - It is obviously thicker than the other discs in its area of the spine

32  *One mechanism of swelling in the disc - Osmotic pressure*

33  *D<sub>2</sub>*

- **DISC THIN at POSTERIOR**
  - The space at the posterior of the disc is diminished, with
  - the vertebra just noticeably misaligned posteriorward and inferiorward.
  - The disc condition has proceeded beyond the acute stage. A D2 takes 6 months to develop

34  *D<sub>3</sub>*

- **DISC VERY THIN at POSTERIOR**
  - The disc is extremely wedged, the body having misaligned very posteriorward and inferiorward. This is a chronic state. This takes 3 to 5 years to develop

35  *D<sub>4</sub>*

- TOTAL DISC IS THIN
  - The total disc thickness is observably diminished, and may be reduced to about two-thirds of its original height.

(continued...)

36  ***D<sub>4</sub> (continued)***

- The vertebra is misaligned posteriorward and inferiorward.
- There is minimal damage to the vertebral body above the disc, with
- some evidence of arthritis or exostosis.
- This condition has become more chronic than above. This takes 5 to 8 years to develop

37  ***D<sub>5</sub>***

- TOTAL DISC VERY THIN
  - The total disc is decreased to about one-third of its original thickness.
  - The body has misaligned very posteriorward and inferiorward.

38  ***D<sub>5</sub> (continued)***

- There is severe damage to the body of the vertebra above, and
- well-advanced arthritis and exostosis. This takes 8 to 12 years to develop.
- This is much more difficult to correct.

39  ***D<sub>6</sub>***

- TOTAL DISC EXTREMELY THIN
  - The entire disc spacing is greatly diminished, being from two-thirds to totally reduced.
  - The vertebra may be extremely posterior.
  - This is the most chronic and the most difficult to correct. 15 years + to develop

40  ***Note:***

- For further explanation of the disc listings and disc problems, see pages 29 - 31 in the *Textbook of Clinical Chiropractic* by Dr. G. Plaughter, or
- Chapter 5 of the *Gonstead Chiropractic Science and Art* textbook by Herbst.

41  ***Synopsis:***

- Gonstead felt the subluxation occurred at the disk
- The Disk is weakest in rotation
- Movement is life – it keeps the disk hydrated
- Schmorles nodes may indicate subluxation
- Early excess axial loads can lead to spinal problems
- Not all malpositions need to be adjusted
- Level Disk Theory
- Disk Degeneration Listings

42  ***Disk Degeneration Listings***

- Things swell just after an injury
- The spine is not moving due to the injury
- The disk begins to dehydrate
  - Degeneration occurs
    - Starts at the back of the disk
    - Ends with the whole thing getting squished