Does Discography Cause Accelerated Progression of Degeneration
Changes in the Lumbar Disc:
A Ten-Year Matched Cohort Study

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This study was done at Stanford University School of Medicine

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Study Design
Prospective, match-cohort study of disc degeneration progression over 10 years
with and without baseline discography.

Objectives
To compare progression of common degenerative findings between lumbar discs
injected 10 years earlier with those same disc levels in matched subjects not
exposed to discography.

Summary of Background Data
Experimental disc puncture in animal and in vivo studies have demonstrated
accelerated disc degeneration. Whether intradiscal diagnostic or treatment
procedures used in clinical practice causes any damage to the punctured discs over
time is currently unknown.

Methods. Seventy-five subjects without serious low back pain illness underwent a
protocol MRI and an L3/4, L4/5, and L5/S1 discography examination in 1997. A
matched group was enrolled at the same time and underwent the same protocol
MRI examination. Subjects were followed for 10 years.

At 7 to 10 years after baseline assessment, eligible discography and controlled
subjects underwent another protocol MRI examination. MRI graders, blind to group
designation, scored both groups for qualitative findings. Loss of disc height and loss
of disc signal were measured by quantitative methods.

Results. Well-matched cohorts, including 50 discography subjects and 52 control
subjects, were contacted and met eligibility criteria for follow-up evaluation.

In all graded or measured parameters, discs that had been exposed to puncture
and injection had greater progression of degenerative findings compared to control
(noninjected) discs.

New disc herniations were disproportionately found on the side of the annular
puncture.
The quantitative measures of disc height and disc signal also showed significantly greater loss of disc height and signal intensity in the discography disc compared to the control disc.

Conclusion. Modern discography techniques using small gauge needle and limited pressurization resulted in accelerated disc degeneration, disc herniation, loss of disc height and signal and the development of reactive endplate changes compared to match-controls.

Careful consideration of risk and benefit should be used in recommending procedures involving disc injection.

THESE AUTHORS ALSO NOTE:

The years after discography, “in all graded or measured parameters, discs which had been exposed to puncture and injection had greater progression of new degenerative findings.”

“Our findings from this study appear to indicate that small bore needle puncture and limited pressure injection, can clearly cause an increase in progression of degenerative [disc] findings.”

Injecting normal discs even with small gauge needles appears to increase the rate of degeneration in these discs over time.

“The phenomenon of accelerated adjacent segment degeneration adjacent to fusion levels may be, in part, explained by previous disc puncture if discography was used in segments adjacent to the fusion.”

Intradiscal therapeutic strategies, like injecting steroids, sclerosing agents, growth factors, etc., may also have detrimental consequences as a consequence of the injection procedure itself.

The authors suggest that the accelerated disc degeneration caused by discography is secondary to mechanical injury to the annulus and to secondary biochemical cellular processes.

“Disc puncture with even a small gauge needle and limited injection pressures appears to be associated with accelerated disc degenerative processes, disc herniation, loss of disc height and signal and the development of reactive endplate changes compared to match-controls.”

KEY POINTS FROM AUTHORS:

“Discography using modern small needle disc puncture resulted in accelerated disc degeneration over 10-year follow-up compared to matched controls.”
"Findings of new disc herniation, new endplate changes, and progression of disc degeneration grade were all found more frequently in discs exposed to disc injection."

Disc height loss was greater in the discs exposed to disc injection.

New disc herniation was found disproportionately on the side of the disc injection compared to the contralateral side.

KEY POINTS FROM DAN MURPHY

1) The objective of this study was to compare progression of common degenerative findings between lumbar discs injected 10 years earlier with those same disc levels in matched subjects not exposed to discography. The study used 102 subjects, 50 who had discography and 52 who were matched controls.

2) “In all graded or measured parameters, discs that had been exposed to puncture and injection had greater progression of degenerative findings compared to control (noninjected) discs.”

3) “Small bore needle puncture and limited pressure injection, can clearly cause an increase in progression of degenerative [disc] findings.”

4) Injecting normal discs even with small gauge needles appears to increase the rate of degeneration in these discs over time.

5) Intradiscal therapeutic strategies, like injecting steroids, sclerosing agents, etc, may also have detrimental consequences as a consequence of the injection procedure itself.

6) The accelerated disc degeneration caused by discography is secondary to mechanical injury to the annulus and to secondary biochemical cellular processes.

7) “Disc puncture with even a small gauge needle and limited injection pressures appears to be associated with accelerated disc degenerative processes, disc herniation, loss of disc height and signal and the development of reactive endplate changes compared to match-controls.”

COMMENT FROM DAN MURPHY

This study indicates that disrupting the integrity of the annular ring of the disc with a needle, either for diagnostics or for treatment, tends to accelerate disc degenerative disease. These procedures should not be performed without considering these risks.