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Clinical Study

Cost-effectiveness of microdiscectomy versus endoscopic discectomy for lumbar disc herniation

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ABSTRACT

BACKGROUND CONTEXT: Microdiscectomy is a standard technique for the surgical treatment of lumbar disc herniation (LDH). Endoscopic discectomy (ED) is another surgical option that has become popular owing to reports of shorter hospitalization and earlier return to work. No study has evaluated health care costs associated with lumbar discectomy techniques and compared cost-effectiveness.

PURPOSE: To assess the cost-effectiveness of four surgical techniques for LDH: microdiscectomy (MD), transforaminal endoscopic lumbar discectomy (TELD), interlaminar endoscopic lumbar discectomy (IELD), and unilateral biportal endoscopic discectomy (UBED).

STUDY DESIGN AND SETTING: Retrospective analysis.

PATIENT SAMPLE: Patients who underwent either MD or ED for primary LDH with 1-year follow-up between the ages of 20 and 60 years old.

OUTCOME MEASURES: Incremental cost-effectiveness ratio (ICER).

METHODS: Five hundred sixty-five patients aged 20–60 years who underwent treatment using one of the four surgical techniques with at least 1-year follow-up were reviewed. Health care costs were defined as the sum of direct and indirect costs. The former included the covered and uncovered costs of the National Health Insurance from operation to 1-year follow-up; indirect costs included costs incurred by work loss. Direct and indirect costs were evaluated separately. ICER was determined using cost/quality-adjusted life year (QALY). Health care costs and ICER were compared statistically among the four surgical groups. Cost-effectiveness was compared statistically between MD and ED.

RESULTS: One hundred fifty-seven patients who underwent TELD, 132 for IELD, 140 for UBED, and 136 for MD were enrolled. The direct costs of TELD, IELD, UBED, and MD were $3,452.2±1,211.5, $3,907.3±895.3, $4,049.2±1,134.6, and $4,302.1±1,028.9, respectively ($p<.01$). The indirect costs of TELD, IELD, UBED, and MD were $574.5±495.9, $587.8±488.3, $647.4±455.6, and $759.7±491.7, respectively ($p<.01$). The 1-year QALY gains were 0.208 for TELD, 0.211 for IELD, 0.194 for UBED, and 0.186 for MD. ICER (costs/QALY) was the highest for MD ($34,840.4±25,477.9, $p<.01$). Compared with MD, ED saved an additional net of $8,064 per QALY ($p<.01$). There was no significant difference in the ICERs among the three endoscopic techniques.

CONCLUSIONS: ED was more cost-effective compared with MD at 1-year follow up.

Keywords: Cost-effectiveness; Endoscopic discectomy; Incremental cost-effectiveness ratio; Microdiscectomy; Quality-adjusted life year