Patients' Preference of the Timed Up and Go Test or Patient-Reported Outcome Measures Before and After Surgery for Lumbar Degenerative Disk Disease

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■ BACKGROUND: **The Timed Up and Go (TUG) test, as a measure of objective functional impairment in lumbar degenerative disk disease (DDD), complements patient-reported outcome measures (PROMs) of subjective functional impairment.**

■ METHODS: **Prospective 2-center study on consecutive patients scheduled for surgical treatment for lumbar DDD who underwent an objective (TUG test) and subjective (PROMs) functional assessment before and 1 and 3 days after surgery. PROMs included the visual analog scale (VAS), Roland-Morris Disability Index (RMDI), Oswestry Disability Index (ODI), Euro-Qol (EQ-5D), and Short Form 12 (SF-12) questionnaires. On completion of each assessment, patients were asked whether they would prefer performing the TUG test or completing the PROMs questionnaires.**

■ RESULTS: **A total of 109 of 125 patients (87.2%) completed the assessments. Preoperatively, patients were 2.18 times as likely to prefer the TUG test to the PROMs (odds ratio [OR], 2.18; 95% confidence interval [CI], 1.27–3.75). On postoperative days 1 and 3, patients were 5.79 (OR, 5.79; 95% CI, 3.23–10.37) and 6.33 times as likely to prefer the TUG test to the PROMs, respectively (OR, 6.33; 95% CI, 3.51–11.41). There were no statistical differences in baseline characteristics, TUG *t* scores, VAS, RMDI, ODI, SF-12, and EQ-5D index between patients preferring either the TUG test or the PROMs questionnaires.**

■ CONCLUSIONS: **The TUG test is preferred over a battery of PROMs by 60%–70% of patients with lumbar DDD not only in the preoperative, but also in the postoperative, setting. High functional disability does not result in avoidance of the TUG test, and repeated assessments lead to higher preference.**

INTRODUCTION

Commonly used pre- and postoperative measures for patients with lumbar degenerative disk disease (DDD) include a panel of well-established questionnaires, such as the visual analog scale (VAS) for back and leg pain intensity, the Oswestry Disability Index (ODI) and Roland-Morris Disability Index (RMDI) for functional impairment, and the Short Form 36 or Short Form 12 (SF-12) and Euro-Qol (EQ-5D) for health-related quality of life (hrQoL).[1] However, these patient-reported outcome measures (PROMs) have some shortcomings; they

Key words
- Degenerative disk disease
- Functional impairment
- Health-related quality of life
- Lumbar disk herniation
- Lumbar spine stenosis
- Objective
- Patient-reported outcome measures
- Patients' preference
- Spine surgery
- Subjective
- Timed Up and Go test

Abbreviations and Acronyms
CI: Confidence interval
DDD: Degenerative disk disease
EQ-5D: Euro-Qol
hrQoL: Health-related quality of life
ODI: Oswestry Disability Index
OFI: Objective functional impairment
OR: Odds ratio
PROM: Patient-reported outcome measure
RMDI: Roland-Morris Disability Index
SF-12: Short Form 12
TUG: Timed Up and Go
VAS: Visual analog scale

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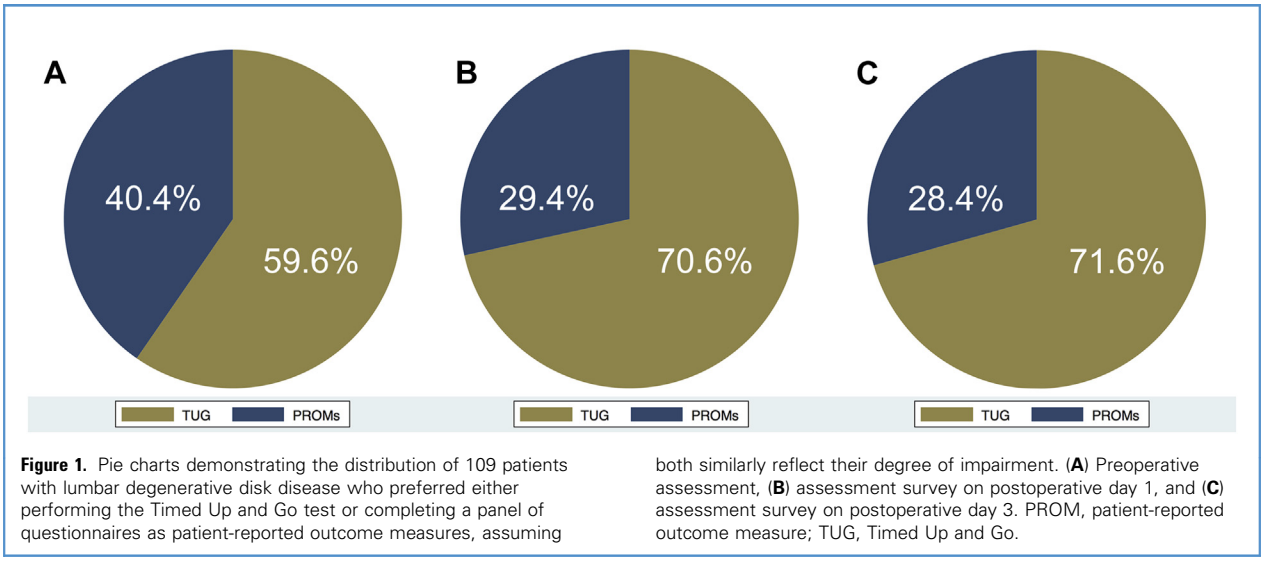

Figure 1. Pie charts demonstrating the distribution of 109 patients with lumbar degenerative disk disease who preferred either performing the Timed Up and Go test or completing a panel of questionnaires as patient-reported outcome measures, assuming both similarly reflect their degree of impairment. (**A**) Preoperative assessment, (**B**) assessment survey on postoperative day 1, and (**C**) assessment survey on postoperative day 3. PROM, patient-reported outcome measure; TUG, Timed Up and Go.

measure self-rated, and therefore subjective, hrQoL or disease-specific disability, but are mostly not standardized for age and sex.

To also objectify functional impairment, the Timed Up and Go (TUG) test was proposed,[2] applied in a clinical setting,[3] and correspondingly validated with stratifications for patients' age and sex.[4] The TUG test is quick and easy to perform and correlates well with pain intensity, functional impairment, and hrQoL before and after surgery for lumbar DDD.[5] Its upper limit of normal was determined as 11.52 seconds, and the scores in the diseased population ranged between 2.9 and 127.9 seconds.[4] The proposed severity stratification into no, mild, moderate, and severe objective functional impairment (OFI) was found to be valid and easy to apply by the use of a free smartphone application (the TUG app, which is available for smartphones and can be downloaded free of charge in the Apple or Google app store in multiple languages, including English, German, French, Italian, Spanish, Portuguese, Turkish, Romanian, Hungarian, Dutch, Croatian, Arab, Chinese, Russian, and Albanian).[6] Its minimally clinical important difference was established with an MCID of 3.4 seconds.[7] As opposed to currently applied PROMs, the TUG test was shown to be less dependent of sex bias,[8,9] body mass index,[10] and age.[11] As for the subjective measures, there was no good correlation with commonly used radiologic grading scales (eg, Modic changes, Pfirrmann grades)[12] for lumbar DDD.

Despite these advantages, patients' acceptance of OFI assessment by the TUG test in the pre- and postoperative setting remains currently unknown. Performance of the TUG test requires the patients to get up from a chair, walk 3 m twice, and sit down again.[2-4] Because this should be done as quickly as possible, the TUG test involves a certain degree of physical activity and patient compliance. This could exacerbate pain in surgical candidates or those who just underwent surgery. On the other hand, filling out a comprehensive panel of PROMs (repeatedly) can often be perceived as bothersome by patients. It requires concentration and might even provoke additional pain when sitting on a chair or sitting up in bed to fill out the questionnaires, which takes a considerable amount of time to do, leading to a putative bias or misinterpretation of the clinical situation by the treating physician.

In evidence-based medicine, decision-making, research evidence, clinical circumstance, and the patients' preferences should be taken into account.[1] Therefore, the aim of this study was to report the patients' preference of the TUG test or well-established PROMs in a perioperative setting in patients with lumbar DDD.

MATERIALS AND METHODS

From the 375 patients who prospectively underwent a comprehensive objective (TUG test) and subjective (PROMs) functional assessment before and 1 and 3 days after surgery for lumbar DDD between September 2013 and December 2015 at the neurosurgery departments of the University Hospital Geneva and Cantonal Hospital St. Gallen in Switzerland (see previous reports[2-5,7-10]), a subset of 125 patients from the latter study center were asked to participate in this survey on completion of each assessment. The study was approved by the Institutional Review Boards of the University of Geneva (14-079) and the Ethics Committee St. Gallen (14/049). Written informed consent was obtained from every study participant.

Data Collection and Processing

Patient demographics, including age, sex, body mass index, work status, comorbidity (Charlson Comorbidity Index[13] and American Society of Anesthesiologists score[14]), type of surgery and levels, motor deficit (British Medical Research Council), and morphine use, were assessed. Assessment of OFI was done using the TUG test as previously described,[2-4] and expressed using standardized t scores.[4] Assessment of subjective functional impairment included VAS for back and leg pain (scale from 0 to 10), RMDI[15] (24 items ranging from 0 [no disability] to