



## Quality of Life and Work Capacity Are Unrelated to Approach or Complications After Pituitary Surgery

Erik Uvelius<sup>1</sup>, Nazia Castelo<sup>1</sup>, Babar Kahlon<sup>1</sup>, Christer Svensson<sup>2</sup>, Anders Cervin<sup>3</sup>, Peter Höglund<sup>4</sup>, Stig Valdemarsson<sup>5</sup>, Peter Siesjö<sup>1</sup>

■ **OBJECTIVE:** Endoscopic pituitary surgery has shown favorable clinical outcomes. Less is known about the impact of surgical approaches on health-related quality of life (HRQoL) and work capacity. The present study was undertaken to compare transsphenoidal microscope-assisted surgery with endoscopic transsphenoidal surgery regarding preoperative and surgical factors for the final outcome of HRQoL and work capacity.

■ **METHODS:** In a retrospective study of patients operated on for pituitary adenoma, outcome was compared between those operated on before and after transition with endoscopic surgery at our department. Data were gathered via patient questionnaires and patients' files.

■ **RESULTS:** After exclusions, 235 patients were included (99 microsurgical and 136 endoscopic). Frequency of complications was similar but tumor size was significantly larger in the endoscopic group. Complications did not affect HRQoL or work capacity. HRQoL was not affected by surgical technique but showed an overall trend toward lower values compared with the general population. Sick leave, return to work frequency, and permanent sick leave were not affected by surgical technique. Female gender was a factor for lower ratings in all outcome variables.

■ **CONCLUSIONS:** Surgical technique does not influence HRQoL or work capacity in this long-term follow-up

although both are decreased compared with the general population. We conclude that fully endoscopic pituitary surgery, despite including larger tumors, bears the same risk for complications as microsurgery. In addition, females have a greater risk for decrease in HRQoL and work ability. This factor should be taken into account when informing patients and appreciating expectations of treatment.

### INTRODUCTION

In contrast to the introduction of new drugs in clinical medicine, the launch of new surgical techniques is seldom preceded by prospective clinical trials. Instead, surgical techniques are mostly evaluated after their introduction and then compared with previous techniques regarding medical effectiveness and cost efficiency.<sup>1</sup> Evaluations often focus on conventional outcome factors such as resection rate, recurrence, or complications.<sup>2-5</sup> The introduction of purely endoscopic transsphenoidal pituitary surgery has been evaluated in various studies, often showing comparable rates of gross total resection, lower incidence of complications, shorter hospital stay, and shorter time of surgery compared with microsurgical transsphenoidal surgery, but some studies have been neutral.<sup>2-4,6-8</sup> No randomized trials have been initiated.

During recent years, the patient's perspective after different therapies has come into focus with the development of the health-

### Key words

- Health-related quality of life
- Pituitary adenoma
- Pituitary surgery
- Transsphenoidal surgery
- Work capacity

### Abbreviations and Acronyms

- CSF:** Cerebrospinal fluid  
**DI:** Diabetes insipidus  
**HR:** Health-related  
**IQR:** Interquartile range  
**KPS:** Karnofsky Performance Status  
**pa-KPS:** Patient-assessed Karnofsky Performance Status  
**QoL:** Quality of life  
**VAS:** Visual analog scale

From the Departments of <sup>1</sup>Clinical Sciences Lund, Neurosurgery and <sup>2</sup>Clinical Sciences Lund, Otorhinolaryngology, Lund University, Skåne University Hospital, Lund, Sweden; <sup>3</sup>Otolaryngology (Rhinology), University of Queensland, Department of Otolaryngology, Head & Neck Surgery, Royal Brisbane & Women's Hospital, Royal Brisbane Clinical School, Herston, Queensland, Australia; and Departments of <sup>4</sup>Clinical Chemistry & Pharmacology, Laboratory Medicine and <sup>5</sup>Clinical Sciences Lund, Oncology, Lund University, Skåne University Hospital, Lund, Sweden

To whom correspondence should be addressed: Erik Uvelius, M.D.

[E-mail: erik.uvelius@med.lu.se]

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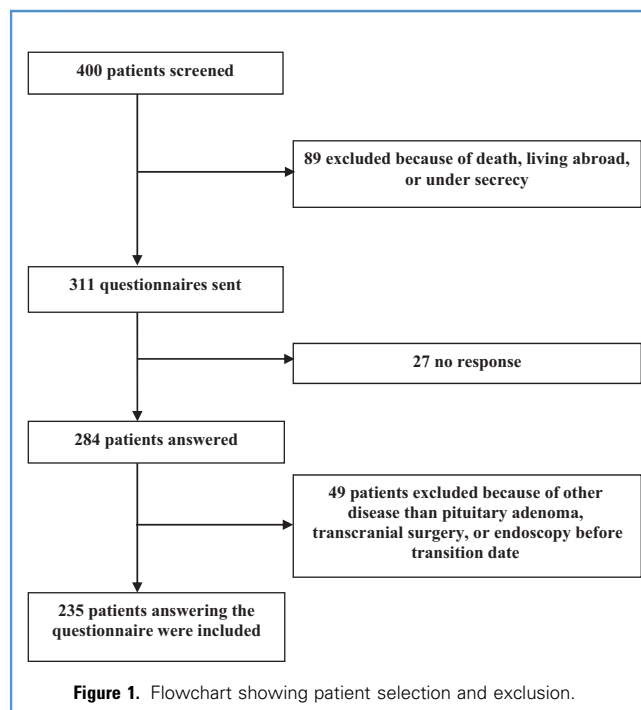
related (HR) quality of life (QoL) concept.<sup>9</sup> Both generic scales (e.g., EQ-5D, Short-Form 36<sup>10,11</sup>) and disease-specific scales (e.g., AcroQoL for acromegaly and the Anterior Skull Base Nasal Inventory 12 evaluating nasal QoL after endonasal surgery) have been used for patients with pituitary adenomas and for endoscopic pituitary surgery.<sup>12-14</sup> HRQoL is reported to be affected in all subgroups of pituitary adenomas and is often significantly decreased also after what is considered successful surgical treatment.<sup>15-18</sup> Surgical treatment of pituitary adenomas can cause a decreased HRQoL by, for example, causing hypopituitarism, optic nerve damage, or injury to other neural structures. In addition, the transsphenoidal route can cause nasal morbidity such as crusting, bleeding, and decreased olfactory function, which at least in the shorter perspective, causes or adds to a decreased HRQoL.<sup>19-21</sup> Decreased HRQoL is expected to cause decreased work capacity, which can be measured by changes in work ability. Work capacity has the advantage of being biased by neither the health providers or the patient's views but has the disadvantage of not being meaningful in retired or unemployed patients.

Data on the impact of different surgical approaches to pituitary adenomas on HRQoL and work capacity are scarce. Therefore, the present retrospective study was undertaken to compare transsphenoidal microscope-assisted pituitary surgery to a purely endoscopic transsphenoidal approach with regard to preoperative findings and surgical factors for the final outcome of generic HRQoL and work capacity.

## METHODS

### Patients

All procedures were performed at the Department of Neurosurgery, Skåne University Hospital, Lund, Sweden, which is a tertiary referral center for 1.7 million inhabitants and the only center in the region for pituitary surgery. The purely endoscopic approach has been exclusively used in transsphenoidal pituitary surgery at our department since April 2004. Before this time, from 2002 to 2004, the surgical approach was selected according to the surgeon's preference. Since the transition to endoscopy, no microsurgical transsphenoidal procedures have been performed at our center. The patient data set was extracted from the Swedish National Pituitary Registry encompassing all diagnosed pituitary adenomas and craniopharyngiomas, observed or treated, medically or surgically. The selected study population intended to compare 200 consecutive surgically treated patients with pituitary adenoma before April 2004 (date of final change to endoscopic surgery) with 200 consecutive patients after March 2004. At follow-up (February 2013), 89 patients were excluded because of death, living abroad, or under secrecy (Figure 1). Thus, 311 patients were sent questionnaires with self-assessment of current EQ-5D-3L, Karnofsky Performance Status (KPS) before surgery and at follow-up and our custom-made questionnaire on work capacity. The response rate was 91% (284/311). We later excluded 24 patients because of other disease than pituitary adenoma and 20 patients because of transcranial surgery. We also excluded 5 patients who underwent endoscopic surgery before the transition in April 2004. Thus, the final study population was 235 patients. Patients' willingness to answer our questionnaires could be affected by factors such as treatment result, complications, or gender. To detect any



such bias, patients surgically treated during the study period not participating in the study were reviewed and are presented as a comparison of basic data ( $n = 131$ ).

### Database

A database was compiled with the results of the questionnaires, data from the national pituitary registry, and complementary information from medical records including age, gender, tumor volume, tumor diameter, histology, surgical complications, and reoperation because of tumor recurrence within 5 years of primary surgery. Because we also analyzed work capacity and return to work, the group was divided by normal retirement age (65 years in Sweden in 2013).

### EQ-5D-3L

The EQ-5D-3L is a generic HRQoL scale in 2 parts.<sup>10</sup> First, 5 dimensions of QoL (mobility, self-care, usual activities, pain, and anxiety) are graded in 3 levels (1, no problems; 2, some problems; or 3, extreme problems) giving a 5-digit QoL profile. This profile can be summarized as a single number (EQ-5D index) where 1 is the best QoL imaginable and 0 is death. The EQ-5D index is calculated by subtracting numeric factors from the best health imaginable. These factors vary with social and cultural factors and are calculated from reference materials in different countries. There is no Swedish reference material. Therefore, Swedish studies<sup>22</sup> have used the British reference material<sup>23</sup> and we have adhered to this strategy in the present study. The EQ-5D index compares the current QoL level with the general population.

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