Patients’ perceptions of recovery after routine extraction of healthy premolars

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Introduction: In this prospective study, we evaluated patients’ perceptions of recovery after orthodontic premolar extractions. Methods: Thirty patients (18 girls, 12 boys, mean age 14.6 ± 3.8 years) were given a health-related quality of life questionnaire to be completed each postoperative day (POD) for 7 days. The questionnaire was designed to assess each patient’s perception of recovery: pain, oral function, general activity measures, and other variables. The impact of possible predictor variables, such as age, sex, length of surgical procedure, number of simultaneous extractions, and time during the day, was assessed. Results: Severe pain (16.7%, 3.3%) and consumption of analgesics (70%, 13.2%) declined dramatically from POD 1 to POD 2. Improvements in oral function and other symptoms were evident by POD 2. Absence from school resembled interference in daily activities (POD 2). Age was the most significant predictor variable, with results showing delayed recoveries for patients older than 15 years. The most striking differences were reported for enjoying food (P < .05), taste (P < .05), and food stagnation (P < .05). The number of extractions performed at the same appointment had no affect on posttreatment recovery. Conclusions: This study was designed to provide baseline health-related quality of life information with which to compare other surgical procedures frequently needed in orthodontic treatment, such as removal of third molars and exposure of impacted teeth. Additionally, it provides information for patients and clinicians on postoperative recovery after premolar orthodontic extractions. (Am J Orthod Dentofacial Orthop 2007;131:170-5)
who had similar procedures. Surprisingly, we found no study in the English literature focusing on either the immediate postoperative period or patients’ perceptions of the various aspects of recovery after orthodontic premolar extractions.

Our aim in this prospective study was to assess patients’ perceptions of immediate postoperative recovery after orthodontic premolar extractions in the light of the established experience of the HRQOL instrument gained in surgical exposure of impacted canines.

**SUBJECTS AND METHODS**

Patients scheduled for orthodontic premolar extractions were asked to enroll in a prospective clinical study conducted in 3 oral and maxillofacial surgery clinics beginning in January 2003. Thirty adolescent patients, 18 girls and 12 boys, mean age 14.6 ± 3.8 years, in good general health, were included in this study and underwent orthodontic extractions of 54 premolars; 20 patients had at least 2 simultaneous extractions.

On the day of the surgery, after each patient consented to participate in the study, baseline data (age, sex, orthodontist’s name, surgeon’s name, and tooth number) were recorded.

The simple and straightforward surgical procedure was performed by 2 authors (G.C. and R.Z.), both senior oral and maxillofacial surgeons, according to a standard protocol that included local anesthesia and tooth extraction. Subsequently, the surgeon recorded details of the surgery, including hour, duration of the surgical procedure, and medication prescribed. Postoperative analgesics were prescribed to all patients, but they were instructed to take them only if required.

Two HRQOL instruments were combined for use in this study (Fig 1). This questionnaire was designed to assess patient perception of recovery in 4 main areas: pain, oral function, general activity, and other symptoms. Pain definitions referred to the severity of pain and the consumption of analgesics. Oral function dealt specifically with swallowing, mouth opening, ability to eat and enjoy ordinary food, and speech. General activity variables targeted the ability to participate in routine daily activities, sleeping, and school attendance. Other symptoms included bleeding, bruising, swelling, food stagnation in surgical sites, a bad taste or bad smell, and general malaise. Patients were not required to return for postsurgery visits but were encouraged to do so if symptoms worsened.

For each question, the patients were asked to mark the answer best describing how they felt. The degree of pain was assessed on a visual analog scale of 1 to 10; numbers 1 to 3 referred to slight pain, 4 to 7 meant moderate pain, and 8 to 10 referred to severe pain.

The remaining variables were assessed on a 5-point scale as follows: 1, not at all; 2, very little; 3, some; 4, quite a lot; and 5, severe.

The modified HRQOL questionnaire was given to all patients after the surgery. They were asked to complete the questionnaire at the end of each of the 7 postoperative days. In addition, they were telephoned daily to encourage compliance in completing the questionnaire.

“Recovery time,” defined as the median number of days needed to reach “slight pain” (1-3 on the 10 point scale) and “not at all/very little” (1 or 2 on the 5 point scale), was assessed for each variable examined.

Descriptive statistics were used to summarize separate recovery times in relation to age, sex, time during the day (morning vs afternoon), surgical procedure duration of less than 20 minutes vs 20 minutes or longer, and number of simultaneously extracted teeth. The influence of each predictor variable on the “recovery time” was assessed by a multiple comparisons statistical analysis with the Fisher exact test, with $P < .05$ taken as the minimum criterion of significance.

**RESULTS**

All patients returned the questionnaire at the 1-week postoperative appointment, for a 100% response rate.

Mean duration of the surgical procedure was 19.8 ± 8 minutes. For 12 of the 30 patients, surgery time was more than 20 minutes.

On postoperative day (POD) 1, 16.7% reported that pain was severe (score 8-10 or 10) at some point in the day; by POD 2, the number had decreased to 3.3% (Fig 2). Consumption of analgesics declined gradually over the first 3 postoperative days (70%, 13.2%, 3.3%, respectively).

Evaluation of oral function, interference in daily activity, and other were reported as the percentages of patients with substantial impairment (scores 4 and 5) follows.

On POD 1, difficulty in eating was the most frequently reported symptom (80%), followed by inability to enjoy regular food (40%), swallowing (13.3%), speech (10%), and limitation of mouth opening (10%) (Fig 3). Improvement in most oral functions was evident by POD 2 (inability to enjoy regular food [16.7%], swallowing [3.3%], speech [0%], and limitation in mouth opening [0%]), with the exception of difficulty in eating (20%), which improved only by POD 3.

On POD 1, 33.3% of the patients were absent from school, even though only 23.3% reported substantial interference in daily activity (Fig 4). Limitation in daily
Dear parent/patient,

In order to improve the quality of care we provide for our patients, it is important for us to know how the surgical exposure has affected you. We ask you to take a few moments to complete this survey form. Every day you will be telephoned and asked the following questions. Please choose the number that corresponds most closely to your assessment over the past 24 hours.

1. Rate the worst pain you have felt during the past 24 hours on a scale from 1 to 10
1-3 refers to slight pain, 4-7 moderate pain, and 8-10 severe pain

For the following questions, please use this system:
Not at all=1 Very little=2 A little=3 Quite a lot =4 Severe=5

2. Have you taken any medication to relieve pain today?
3. Has it been difficult to swallow today?
4. Has it been difficult to open your mouth today?
5. Were there any foods you could not eat today?
6. Have you been able to enjoy your food today?
7. Has speech been difficult today?
8. Was it difficult to sleep last night?
9. Have you missed school/work?
10. Has it been difficult to continue your daily activities today?
11. Has there been any swelling today?
12. Has there been bruising today?
13. Has there been bleeding today?
14. Has there been any malaise today?
15. Have you had a bad taste or bad smell in your mouth today?
16. Has there been any food debris in the operation area today?

Fig 1. Surgical exposure questionnaire.
routine declined to 13.3% (4 subjects) by POD 2, resembling absence from school, which reached 20%. Sleep was minimally affected during the entire postsurgical period.

The presence of a bad taste or smell was the major distressing postoperative symptom, reportedly the greatest on POD 1 (30%), followed by bleeding (20%), food stagnation (13.3%), and swelling (10%) (Fig 5).

The influence of predictor variables on “recovery time” was assessed. Recovery was not significantly affected by sex, number of extractions, and duration of treatment. The only predictor variable was age. Patients above the age of 15 years (n = 12) had slower recoveries compared with patients under 15 years (n = 18) regarding the ability to enjoy food (POD 3 vs 1, P < .05), taste and smell (POD 3 vs 1, P < .05), and food stagnation (POD 2 vs 1, P < .05) (Fig 7).

DISCUSSION

Despite progress in preoperative, operative, and postoperative management, which makes dental treat-
ment today easier than ever, many dental patients are still concerned about the operative and postoperative sequelae of various procedures. Regardless of the surgical and technical simplicity of orthodontic premolar extractions, the obvious fact that a wound is created makes it reasonable to assume that it will have some adverse influence on several aspects of the HRQOL. Nevertheless, no quantitative study has defined the difficulties that a patient undergoing this procedure can expect in the immediate postoperative days.

Our patient sample was young, with a slight preponderance of girls (60%). The results show that most oral functions recovered within 2 days. Pain and analgesic consumption also required 2 days, whereas all other measurements attained minimal levels within 1 day. The questionnaire contained a visual analog scale, which has its own limitations, and its use in young patients has further limitations. Nevertheless, their rapid recoveries demonstrate that pain was not a big concern.

We previously used the same HRQOL questionnaire for studying posttreatment recovery after surgical exposure of impacted teeth. A comparison of these results with those after surgical exposure of impacted teeth treated with a closed-eruption surgical-orthodontic technique shows that orthodontic premolar extractions lead to a shorter postoperative recovery time (2 vs 3 days). It can be speculated that the fact that there is no need to raise a surgical flap during premolar orthodontic extraction is responsible for the improved recovery.

Age (>15) was the only predictor variable significantly affecting recovery. It affected the ability to enjoy food, taste and smell, and food stagnation. A recent study of fear of dentistry among Finnish children of various ages found it to be higher among 12- and 15-year-old children than among the younger group. Perhaps because teenagers are more aware and perceptive, and have an intensive lifestyle, their expectations about full recovery are higher, when compared with younger children. Therefore, minor interferences for the younger ones become more noteworthy for the teenagers.

It is perhaps surprising that 1 premolar extraction vs 2 or more premolar extractions at the same surgical appointment resulted in a similar recovery period. Thus, the concern of many patients and parents that, if more than 1 extraction is performed simultaneously, the child will suffer more, is largely unsupported.

![Fig 7. Median days needed as “recovery time” for each variable studied in entire sample.](image)
CONCLUSIONS

This study describes several variables related to recovery after premolar orthodontic extractions from the patients’ perspectives. Within the limits of this sample, it can be concluded that:

1. Patients should expect, in general, recovery within 2 days after orthodontic premolar extractions.
2. Teenagers over 15 years will experience delayed recoveries.
3. The number of extractions at the same appointment has no effect on posttreatment recovery, supporting the view that performing more than 1 extraction at the same surgical appointment is preferred over dividing the extractions into 2 or more separate sessions.

These findings can be used to provide information for the patient, along with the more direct factors of treatment options. This study shows that recovery is extremely rapid, and the practitioner should allay patient concern about the extraction procedure. This should be done with the aim of eliminating it as a factor, in favor of the objective reasons for or against extraction in the orthodontic treatment plan.

REFERENCES