

# DENTAL ANXIETY BEFORE AND AFTER ENDODONTIC MICROSURGERY

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## ABSTRACT

**INTRODUCTION:** Endodontic microsurgery is a treatment option if previous procedures have been unsuccessful. As a result, many patients may suffer from a high level of dental anxiety. Dental anxiety impacts different aspects of life, so it is important to measure it with psychometric scales to avoid its underestimation. Previous studies related to dental anxiety used visual analogue scale (VAS), which is a quick and simple non-verbal measurement instrument.

**OBJECTIVES:** The aim of this study was to measure and compare pre- and post-endodontic microsurgery dental anxiety using VAS.

**MATERIAL AND METHODS:** Thirty-five patients, who met the inclusion criteria and were previously scheduled to undergo endodontic microsurgery, answered VAS related to dental anxiety before and after the procedure. Microsurgery was performed by postgraduate students and monitored by a clinical supervisor. VAS values were analyzed with descriptive statistics. Shapiro-Wilk test determined to use Wilcoxon rank-sum test. Confidence level of the study was 95% and  $p < 0.05$ .

**RESULTS:** Anxiety levels showed no significant change over the analyzed period. Pre- and post-endodontic microsurgery anxiety levels did not markedly change in relation to gender either. Nevertheless, women's anxiety median values tended to decrease after the endodontic microsurgery. On the contrary, men tended to increase their anxiety levels after the procedure.

**CONCLUSIONS:** Within the limits of the present study, there was not a statistically significant difference in the pre- and post-endodontic microsurgery anxiety values.

**KEY WORDS:** dental anxiety, apicoectomy, microsurgery.

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## INTRODUCTION

Endodontic microsurgery is a procedure that a tooth could require after the failure of previous treatments [1]. Consequently, the patient may suffer from a high level of concern, stress, fear, or anxiety. It has been researched that dental anxiety can affect a variety of aspects of life, including physiological, behavioral, and health [2]. Therefore, it is necessary to measure dental anxiety to

avoid its impacts. When dentists try to infer the presence of dental anxiety in their patients, they often think it is lower than it really is [3]. Therefore, dentists need scales to clearly identify dental anxiety. There are several scales and ways to measure dental anxiety; some of the most used scales are Corah's dental anxiety scale, modified dental anxiety scale, dental anxiety inventory, etc. Those scales and other are mostly verbal rating scales; hence, difficulties in the interpretation of terms

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could arise [4]. On the other hand, given that the visual analogue scale (VAS) is a non-verbal rating scale, it is not connected with any particular descriptor of the case study [5]. Besides, it is simple and quick, and provides a method to evaluate anxiety before and after a particular circumstance of stress [6].

## OBJECTIVES

The aim of this study was to measure and compare dental anxiety before and after endodontic microsurgery using VAS.

## MATERIAL AND METHODS

This longitudinal study was conducted at the dental clinic of Universidad Peruana Cayetano Heredia, Lima, Perú. The study protocol was approved by the Ethics Committee of Universidad Peruana Cayetano Heredia (file No. 215-10-19).

## PARTICIPANTS

The participants were previously scheduled to undergo endodontic microsurgery. Between 2011 and 2017, in average, microsurgery was used to treat 35 patients per year in the dental clinic. The selection of the sample was non-probabilistic. Given that the mean number of patients in previous years was not so large, we decided to use the same number for our sample. Exclusion criteria involved any psychiatric or neurological disease reported in the medical record and participants aged under 18. Forty-one participants were gathered in eight months, six of which were excluded for not having filled out the scales completely. A total of 35 participants agreed and signed a written informed consent.

## MEASUREMENTS

The visual analogue scale (VAS, 0-10 cm) was used to assess dental anxiety. It was applied before and after endodontic microsurgery. The rating scale ranged from “not anxious at all” to “worst experience ever”. The distance between “not anxious at all” and the patient-made mark was calculated and provided a quantitative variable that was used for statistical evaluation [7]. This kind of scale was employed in similar studies. For statistical purposes and to classify variables into categories, cut-off scores presented in a previous study was used [8], in which score 3 represented participants who experienced anxiety.

## PROCEDURE

The participants completed VAS while they were waiting for their endodontic microsurgery in the waiting

room of the dental clinic. Microsurgery was performed among 2<sup>nd</sup> year postgraduate students of endodontics, and a clinical supervisor monitored the procedure. The microsurgery lasted on average 2-3 hours. The second VAS was completed after microsurgery, while patients were waiting for their medical prescription. The same researcher conducted all the assessments.

## DATA ANALYSIS

Statistical analysis was performed by using statistic software STATA version 15.1 (Stata Corporation). Descriptive values of VAS were obtained before and after the treatment. The Shapiro-Wilk test determined to use the Wilcoxon rank-sum test. The results were shown in a table and in a boxplot graph. The confidence level of the study was 95% and  $p < 0.05$ .

## RESULTS

The average age of participants was 48.23 years, with a range of 19-73 years. The participants included 25 women and 10 men. Before microsurgery, the average level of anxiety was  $3.25 \pm 2.38$ . Eighteen patients rated scores of  $> 3$ . Women presented an average VAS score of  $3.7 \pm 2.45$ , while men indicated a  $2.12 \pm 1.87$  average VAS score. After the procedure, the mean VAS was  $2.95 \pm 2.54$ . Women and men reported an average anxiety level of  $3.14 \pm 2.61$ , and  $2.46 \pm 2.42$ , respectively. In general, there was no significant difference between pre- and post-endodontic microsurgery anxiety values ( $p = 0.35$ ). Likewise, there was no significant difference regarding gender within the same time ( $p = 0.06$ ,  $p = 0.46$ ) (Table 1). Nevertheless, in the evaluation of the median values, we found a trend showing an increase of the level of anxiety in men after the procedure. On the other hand, the anxiety levels of women tended to decrease (Figure 1).

## DISCUSSION

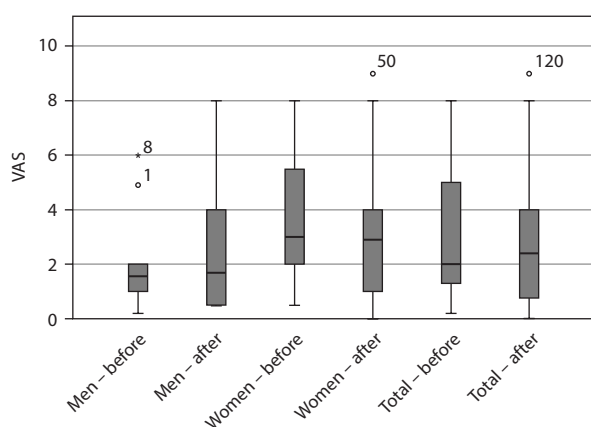
Endodontic treatments and oral surgery are two of the major sources of anxiety in dentistry [9-12]. The aim of this research was to compare the level of anxiety before and after endodontic microsurgery. To the best of our knowledge, this is the first study that specifically compares levels of anxiety in relation to endodontic microsurgery. In our study, we found that the levels of anxiety after microsurgery tend to reduce in women and increase in men.

Interestingly, the pre-microsurgery level of anxiety was low, with a mean of  $3.25 \pm 2.38$ . Our finding was slightly lower than the results of Georgelin-Gurgel *et al.*, who observed a pre-microsurgery level of anxiety mean of  $4.3 \pm 2.9$ . Unlike non-surgical procedures, surgical

**TABLE 1.** Comparison of visual analogue scale (VAS) numeric values pre- and post-endodontic microsurgery according to gender

Subjects	n	Before (n = 35)					After (n = 35)					Significance*
		Mean	Median	Standard deviation	Min.	Max.	Mean	Median	Standard deviation	Min.	Max.	
Men	10	2.12	1.55	1.87	0.20	6.00	2.46	1.70	2.42	0.50	8.00	0.84
Women	25	3.70	3.00	2.45	0.50	8.00	3.14	2.90	2.61	0.00	9.00	0.31
Total	35	3.25	2.00	2.38	0.20	8.00	2.95	2.40	2.54	0.00	9.00	0.35

\*Wilcoxon rank-sum test



**FIGURE 1.** Anxiety levels before and after endodontic microsurgery. Anxiety is described by boxplot graph; it has been evaluated using the median with quartiles of visual analogue scale (VAS) by gender (men and women) and by the overall participants (total) before and after the endodontic treatment

procedures comprise aspects that theoretically could increase anxiety. For instance, endodontic microsurgery is considered the last chance to save a tooth [13, 14]. In addition, it is performed through the apical portion of tooth and requires a great vision of the operative field [13], making the procedure more complex. Finally, there is a risk to damage nearby structures because it is performed outside the tooth. Curiously, despite those facts, in general, patients reported initial low values of anxiety. It has reported that frequent visits to the dentist reduce patients' anxiety [15, 16]. It has been observed that a patient who needs a microsurgery, already experienced previous treatments that failed for different reasons [1]. Therefore, the patient could present a low level of anxiety because of familiarization with the dentist, procedure, and dental clinic.

After the microsurgery, the mean VAS score was  $2.95 \pm 2.54$ . This value was low as well; in fact, it was slightly lower than the cut-off from Georgelin-Gurgel *et al.*, showing that the majority of patients felt no anxiety after endodontic microsurgery. We could not compare our numerical values precisely because, although there are many studies that assess dental anxiety, they involved

non-surgical endodontic treatments [17-22], and scales other than VAS were applied. In fact, in those studies, the level of anxiety tended to decrease after a non-surgical treatment. This trend could be explained by certain positive facts related to the treatment or environment. Some patients in our study could feel a degree of relief when the microsurgery was supervised by a clinical professor, who was present at the operator's side the whole time during the procedure. Likewise, Caltabiano *et al.* described that patients of a student's dental clinic felt less anxious with the presence of a qualified supervisor. Another reason for the decrease of anxiety level could be the fact that the dental clinic where the study was carried out is a widely respected dental clinic for endodontic microsurgery in the country. Therefore, the patients could feel confident about the dental clinic, relying on a family member, friend, or dentist recommendation.

Additionally, when assessing the patients' response according to gender, we did not find statistical differences (Table 1). However, in median values, men tended to increase their anxiety after microsurgery (Figure 1). On the other hand, women showed higher anxiety scores before undergoing microsurgery, but those values decreased considerably after the procedure in comparison to men. The greater reduction in women anxiety scores might be explained because women's responses were more likely to be truthful than those of men. It has been previously reported that women, unlike men, tend to show their feelings of fear in society [23]. Besides, men tend to place themselves in a traditional role, in which they should not be afraid or anxious [24, 25].

It is well-known fact that dental anxiety has been related to bad dental health condition because patients avoid dental attendance [2]. Even more, patients experiencing high levels of dental anxiety are among those with the poorest oral health-related quality of life [26]. Therefore, it is crucial for dentists to take the first step and break their patients' dental anxiety cycle. Measuring dental anxiety level gives dentists the possibility to manage it and building confidence in patients.

Given that the psychometric scale used is a non-verbal rating scale, it is easy to understand and cannot be misinterpreted. Furthermore, VAS has been validated to be used for measuring dental anxiety [5, 27]. Although

VAS is mostly utilized to assess pain, it has been employed to measure anxiety in different studies in various fields, such as pediatric dentistry, surgery, implantology, and other [3, 5, 7, 26, 28, 29].

Even though endodontic microsurgery has been performed worldwide since the late eighties [30], microsurgery in Perú is not common; in fact, only few specialists have a microscope. Hence, our main limitation was sampling, despite the fact that the study was executed in one of the best-known dental clinics for endodontic microsurgery in the country. It took eight months to collect 35 participants. Further studies with larger cohort of participants are essential.

## CONCLUSIONS

Within the limits of the present study, we did not find a statistical difference between pre- and post-endodontic microsurgery anxiety levels.

## CONFLICT OF INTEREST

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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