High weight standard and removal of third molars: a prospective randomized study

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Objective. Compare the degree of exposure to adverse events during the removal of third molars between 2 groups of patients.
Study Design. Researchers designed and implemented a prospective randomized study. The study consisted of overweight and normal-weight patients subjected to the surgical removal of impacted lower third molars. A wide range of predictor variables was registered in the preoperative phase. Statistical calculations were computed.
Results. Five hundred sixty surgeries were performed involving 2 groups (1:1). Adverse events were found in 29.3% of surgeries in overweight patients. The same procedures performed on normal-weight patients resulted in a complication rate of 10.7%. Predictor variables significant to these events were detected.
Conclusions. Overweight patients have 3 times greater risk of experiencing morbidities during the removal of lower third molars compared with patients of normal weight. Our findings have important implications for public health, given the exorbitant growth in the population of patients with high standard weight. (Oral Surg Oral Med Oral Pathol Oral Radiol 2015; 120:554-561)

Overweight and obesity has increased rapidly worldwide,[1] which has led researchers to undertake studies in different areas with this subject.[2-4] In light of the new epidemiologic scenario worldwide,[1] the Ministry of Health of Brazil and the Brazilian Institute of Geography and Statistics announced 2 major surveys on overweight and obesity in 2010. VIGITEL Brazil (Surveillance of Risk and Protection Factors for Chronic Diseases by Telephone Interviews)[5] and Family Expenditure Survey[6] found that 50.1% of the population is overweight.

Despite the aforementioned "obesity epidemic,"[7] there are very few published studies on the experience of oral and maxillofacial surgeons[8-10] and the gaps in academic training when it comes to overweight patients. Studies involving oral and maxillofacial surgery are rare[11]; there is an absence of randomized studies to date.

Given the lack of evidence to compare the occurrence of adverse events during the removal of lower third molars in overweight and normal-weight patients, researchers designed and implemented a study to compare the degree of exposure to adverse events in these 2 groups and to detect and discuss variables for these events.

MATERIALS AND METHODS

Study design

A prospective randomized study was designed and implemented involving overweight and normal-weight patients who underwent surgical interventions for the removal of impacted lower third molars in the Department of Research at the PhD Program in Oral and Maxillofacial Surgery of the University of Pernambuco in Brazil. To be included in the study sample, patients had to fulfill the following eligibility criteria: indication for surgery under local anesthesia, and inclusion in categories I and II of the American Society of Anesthesiologists classification (ASA I and II). The following were the exclusion criteria: age younger than 18 years, absence of second lower molar, body mass index (BMI) less than 18.5 kg/m^2, BMI greater than 29.9 kg/m^2, systemic and/or behavioral disorder that rendered local anesthesia unviable, being pregnant or lactating, recent irradiation, cognitive impairment that rendered the comprehension of the study objectives impossible, and nonacceptance of the methodology. All patients signed statements of informed consent, and the study received approval from the ethics committee of the University of Pernambuco, Brazil (ClinicalTrials.gov Brazil identifier CAAE: 0241.0.097.000-11).

Sample size

The percentage of the Brazilian population who are overweight (50.1%)[6] was used in calculating the sample

Statement of Clinical Relevance

The study helps to expand the experience of dentistry faculties by focusing on the overweight population, showing that this population is highly susceptible to adverse events during the removal of lower third molars and warning students and surgeons with no experience in caring for overweight patients.

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Received for publication Aug 23, 2014; returned for revision Oct 27, 2014; accepted for publication Dec 12, 2014.

2212-4403/$ - see front matter
http://dx.doi.org/10.1016/j.oooo.2014.12.010

size necessary to achieve a reliable estimate of the population proportion at a 90% confidence level ($Z\alpha/2 = 1.645$) and for estimating the maximum error (E) within ±5% (0.05). The sample was established as 280 surgical interventions per group.

Division of groups

The patients were divided into 2 groups: the control group, with 280 surgeries in normal-weight patients (BMI: 18.5-24.9 kg/m^2), and the experimental group, with 280 surgeries in overweight patients (BMI: 25.0-29.9 kg/m^2)—totaling 560 surgeries performed.

Predictor variables: interpretation and recording

A wide range of variables were recorded in the preoperative phase. In clinical practice, standard weight is diagnosed mainly by BMI.[12] Patients' weight and height were measured and recorded to calculate the BMI (weight [kg] divided by height squared [m^2]). The predictor variables were categorized into the following groups: (1) demographic: gender (female/male), age (years), and BMI (high weight standard [overweight] and normal-weight); (2) clinical: associated pathologies (conditions associated with the third molar); and (3) radiographic: level of occlusal plane (occlusal plane of the third molar in relation to the second molar), available retromolar space (distance between distal-most point of the second molar crown and the anterior-most point of the ascending ramus), impaction angle (Winter's classification, measured in degrees [the angle between the crossing of the long axis of the third molar and the occlusal plane]), number of roots (tooth germ, 1 fused root or ≥ 2 roots), root curvature (angle between long axis of crown and the root of the third molar), tooth relation with mandibular canal (distance in millimeters from the root apex to the cortex of mandibular canal), relation with the second molar (relation of the third molar crown with the second molar), crown width (mesio-distal distance of the third molar crown compared with the second molar), and periodontal space (status of space between the root of the third molar and alveolar cortex).

Predictor variables were recorded by a single examiner (Table I). Further data were obtained from *digital* orthopantomography (panoramic picture). The patients were randomly assigned to 1 of 2 previously assessed senior surgeons who had no contact with the patients in the preselection phase and were blinded to the previously collected data.

Adverse events: interpretation and recording

Adverse events (primary outcome variable) in the present study were defined as "any undesirable, unintentional result affecting the patient at the time of surgery that would not have occurred if the operation had gone as planned, requiring additional management beyond that originally planned by the surgeon."[13] To avoid subjectivity and imprecision, qualitative terms (secondary outcome variables) such as *small complication* or *large complication* were purposely avoided in the reports. The revised definition suggests that an *adverse event* is not a fixed reality.

To record adverse events, immediately before surgery the surgeon wrote down the entire surgical plan of the case, from incision to suturing. During the procedure, an examiner verified the technical maneuvers used for the extraction and recorded any intraoperative event that required management beyond that which was originally planned. Surgery time from incision to suturing was also recorded (operative variable).

Surgical technique

All procedures were carried out in the same surgery unit with the same instruments, such as high-speed drills (80,000-150,000 rpm, conical bit number 702), and materials. Local anesthesia was administered (3% lidocaine with noradrenaline at 1:50,000) for the regional blocking of the lower alveolar, lingual, and buccal nerves after aspiration. No sedation method was used in the present study. All extractions were carried out using the standardized method for the surgical removal of impacted third molars as described by Farish and Bouloux.[14]

Statistical methods

Descriptive and bivariate statistics were computed, and the model was adjusted to explain each of the predictor variables, first considering all independent variables with a level of significance up to 15% ($P < .15$). The adjustment of the final model was performed using a backward stepwise procedure, maintaining only those variables with a level of significance up to 5% ($P < .05$). The Statistical Package for the Social Sciences (SPSS, Version 15.0; SPSS Inc., Chicago, IL, USA) was used for the statistical calculations.

RESULTS

A total of 560 surgical interventions were performed on 280 patients included in the study. Bilateral extractions were performed in all patients, but all interventions were performed on different occasions. The mean age of overweight patients (25.1 ± 2.2 years) was found to be slightly higher than that of normal-weight patients (21.6 ± 1.6 years). The ratio of female to male patients was 3:1, which proved to be similar in both groups. Most patients in both groups had lower third molars