Simultaneous removal of third molars and completion of a sagittal split osteotomy: effects of age and presence of third molars

Igor Batista Camargo, DDS, MSc, PhD,[a] Joseph E. Van Sickels, DDS,[b] and Larry L. Cunningham, DDS, MD[b]

Objetives. The risk of removal of third molars (M3) during a sagittal split osteotomy (SSO) is controversial. The purpose of this study was to review our experience with removal of mandibular M3 during versus before SSO.
Study Design. A chart and radiographic review was completed in all patients who underwent an SSO from April 2010 until September 2014. The presence or absence of M3, degree of impaction, age, sex, and occurrence of bad splits were noted. The variables were analyzed using the Pearson χ^2, ANOVA, and Fisher's exact tests set to a significance of 5%.
Results. For the 215 patients, the mean age was 23.28 years with an increase in the incidence of bad splits in older patients ($P = .013$). Sixty-six (30.70%) of them had at least 1 M3 present at the time of surgery. There were 6 (2.79%) bad splits. Paradoxically, looking at the occurrence of bad splits and presence of third molar, when the data were analyzed by the number of patients undergoing the procedure, there was slight evidence of a difference ($P = .073$), but when the data were analyzed by the surgical site, there was a statistically significant association ($P = .05$).
Conclusion. The discrepancy between the 2 ways of analyzing the data may be related to there being double the number of observations when analyzed by surgical site and thus the analysis being more powerful. (Oral Surg Oral Med Oral Pathol Oral Radiol 2016;121:468-473)

Removal of third molars at the time of a bilateral sagittal split is controversial.[1-10] The concern with taking them out simultaneously while doing a sagittal split is that it may complicate the surgery, lead to bad splits, and leave less bone for interfragmentary contact.[1,2,8] Alternatively, others feel that removing them at the same time does not increase the risk of adverse fractures and may decrease the incidence of nerve injury.[5,6,8] The age of patients has also been noted to be a risk factor for adverse fractures during SSO.[3,4,9] However, it is not clear whether younger or older patients have a greater incidence of bad fractures and if the presence or absence of third molars contributes to these findings.[4,7,9,11]

Hence the purpose of this paper is to determine whether there is an increased incidence of adverse fractures when third molars are present at the time of bilateral sagittal splits and to determine if it is age dependent. Our hypothesis was that there would be no difference in the incidence of adverse fractures during a sagittal split between patients who have retained third molars and those who do not and, furthermore, that the age of the patient was not an issue when doing a sagittal split. The aims of this study were to determine (i) if there is a correlation between the adverse fractures ("bad splits") and the age of the patients, (ii) the correlation between the presence or absence of M3 and the adverse fracture, and (iii) the degree of impaction of the M3 and the occurrence of fracture.

This work was supported by CAPES-CNPq and the Brazilian Army. CAPES—Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Post-Graduation Personnel Training Coordination); CNPq—Conselho Nacional de Desenvolvimento Científico e Tecnológico (National Council for Scientific and Technological Development).
[a]Department of Oral and Maxillofacial Surgery, Oral and Maxillofacial Surgeon of Brazilian Army, Recife, PE, Brazil.
[b]Division of Oral and Maxillofacial Surgery, College of Dentistry, University of Kentucky, Lexington, KY, USA.
Received for publication Oct 3, 2015; accepted for publication Nov 28, 2015.

2212-4403/$ - see front matter
http://dx.doi.org/10.1016/j.oooo.2015.11.018

MATERIALS AND METHODS

Study design

This is a retrospective cohort comparative study to examine the prevalence of fractures in patients with and without third molars and the age of the patient at the time of surgery.

Study population

This study included the radiographic and clinical treatment records of all patients who underwent a mandibular sagittal split osteotomy (SSO) for the management of a skeletal deformity in the Department of Oral and Maxillofacial Surgery of University of Kentucky from April 1, 2010 until September 30, 2014. Inclusion criteria were: (i) SSO performed for correction of a dentofacial deformity

Statement of Clinical Relevance

Patients presenting for orthognathic surgery with third molars present in different ages is increasing in clinical practice and can result in bad splits during surgery. Knowledge about this theme is important to develop the treatment plan.

Table I. Demographic characteristics of patients according to age, sex, presence of third molar, bad split, and single versus combined surgery

Variable		*Occurrence*			*Total*
Age		*Mean*	*Maximum*	*Minimum*	215 (100%)
		23.28 ± 10.78	68	12	
Gender		Male	Female		215 (100%)
		73 (34%)	142 (66%)		
Third molars	*Right side third*	*Bilateral third*	*Left side third*	*Absence*	66 third molars
	9 (4.2%)	51 (23.8%)	6 (2.8%)	149 (69.3%)	
Bad splits		*Yes*	*No*		215 (100%)
		6 (2.8%)	209 (97.2%)		
Combined surgery		*Two jaw*	*One Jaw*		215 (100%)
		130 (60.5%)	85 (39.5%)		

Table II. Distribution of bilateral sagittal split osteotomy bad split in patients with and without third molars according to sex and third molar status

Prevalence of third molars in our sample			
Presence: 66 patients (30.7%)		*Absence: 149 patients (69.3%)*	
Patient age	*Patient sex*	*Third molar status*	*Bad split: location of fracture*
18	Female	Full	Proximal
19	Female	Full	Proximal
37	Female	—	Proximal
39	Female	Full	Proximal/distal
40	Female	Full	Proximal
51	Male	—	Proximal

Table III. Demographic characteristics of osteotomies performed according to occurrence of bad splits and presence of third molar

Variable	*Occurrence*		*Total*
Osteotomies	*Bilateral*	*Unilateral*	425 (100%)
	420 (99.82%)	5 (1.18%)	
Third molars	Presence	Absence	425 (100%)
	117 (27.53%)	308 (72.47%)	
Bad splits	*Yes*	*No*	425 (100%)
	6 (1.41%)	419 (98.59%)	
Bad split with presence of third molar	*Yes*	*No*	66 (100%)
	4 (6.06%)	62 (93.94%)	

and malocclusion; (ii) use of rigid fixation; (iii) a minimum of preoperative and postoperative panoramic radiographs; and (iv) complete electronic chart data. Data collected were age, gender, presence or absence of third molars at the site of the osteotomy, and degree of impaction of the M3. Exclusion criteria were: (i) previous mandibular surgery, (ii) cases in which there was an incomplete data, and (iii) patients who underwent other types of ramal osteotomies.

Resources

Patients were referred for correction of mandibular skeletal deformities to 1 of the 2 senior authors at the College of Dentistry, University of Kentucky. All data were collected as a routine part in the clinical care of these patients.

Research procedures

Of those patients who underwent an SSO procedure with or without M3 removal at the time of surgery, the preoperative and postoperative panoramic films and chart notes were reviewed to obtain the studied variables. The primary outcome variable was the occurrence of an adverse fracture during the SSO. The primary predictor variable was the presence or absence of mandibular third molars at the time of surgery. The patients were divided into 2 groups: Group 1 included SSOs of the mandible in patients who underwent concomitant removal of third molars at the time of surgery, and group 2 include SSOs in patients with either congenital absence of third molars or who had the third molars removed before the SSO was performed. The other predictor variable was the age of the patient. The eruption stage of the third molar, if present, was noted. Additional variables studied were sex and whether the patient had 1 or 2 jaw surgeries.

Surgical technique

All patients underwent a standard SSO of the mandible as previously described.[12] Briefly, both senior surgeons use a reciprocating saw to make all the bone cuts before splitting the segments. After splitting the mandible and identification of the nerve, retained M3s were elevated and removed when present. When there was simultaneous removal of the third molar with the SSO, the bone was either cut with a saw blade or, more often, with a fine fissure bur.[11] The segments