ORIGINAL RESEARCH ORİJİNAL ARAŞTIRMA

DOI: 10.5336/dentalsci.2024-101467

Retrospective Cross-Sectional Study on the Age Evaluation of Patients Undergoing Third Molar Extraction in Antalya Region

Antalya Bölgesinde Üçüncü Molar Diş Çekimi Yapılan Hastaların Yaş Değerlendirmesine İlişkin Retrospektif Kesitsel Çalışma

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ABSTRACT Objective: The aim of this retrospective study was to evaluation the age of patients who undergo third molar extraction in a dental hospital where both general and specialist dentists conducted extractions, and to assess the relationship between age and gender, reason for extraction, and the method of extraction. **Material and Methods:** This study involved all simple and surgical extractions of third molars (n=21,912 teeth) conducted by general and specialist dentists at oral and dental health hospital between the years 2015 and 2022. Patients' age, gender, reason for extraction, extracted third molar and method of extraction were analysed. **Results:** In all age groups, the rates of third molar extraction are higher in the mandible compared to the maxilla. Compared to simple extractions, surgical extractions are more common among those under 40 years of age. The analysis of all age groups revealed that surgical extraction was the predominant method, with a rate of 64.4%. Third molar extraction is more common in women with a rate of 59.3%, but this rate decreases with increasing age. **Conclusion:** This study highlights the importance of age in third molar extraction and the differences in extraction methods and gender distribution between different age groups. This may help dentists to adapt their approach according to the age of the patient.

Keywords: Third molar; extraction; age; gender; diagnosis

ÖZET Amaç: Bu retrospektif çalışmanın amacı, hem genel hem de uzman diş hekimlerinin çekim yaptığı bir diş hastanesinde üçüncü molar diş çekimi yapılan hastaların yaşını, yaş ile cinsiyet, çekim nedeni, çekim yöntemi arasındaki ilişkiyi değerlendirmektir. **Gereç ve Yöntemler:** Bu çalışma, 2015-2022 yılları arasında ağız ve diş sağlığı hastanesinde genel ve uzman diş hekimleri tarafından gerçekleştirilen tüm basit ve cerrahi üçüncü molar diş çekimlerini (n=21.912 diş) kapsamaktadır. Hastaların yaşı, cinsiyeti, çekim nedeni, çekilen üçüncü büyük azı dişi ve çekim yöntemi analiz edilmiştir. **Bulgular:** Tüm yaş gruplarında, üçüncü azı dişi çekimi oranları mandibulada maksillaya kıyasla daha yüksektir. Basit çekimlerle karşılaştırıldığında, cerrahi çekimler 40 yaşın altındakiler arasında daha yaygındır. Tüm yaş gruplarının analizi, cerrahi çekimin %64,4'lük bir oranla en baskın yöntem olduğunu ortaya koymuştur. Üçüncü molar diş çekimi %59,3 oranıyla kadınlarda daha yaygındır, ancak bu oran yaş arttıkça azalmaktadır. **Sonuç:** Bu çalışma, üçüncü molar diş çekiminde yaşın önemini ve farklı yaş grupları arasında çekim yöntemleri ve cinsiyet dağılımındaki farklılıkları vurgulamaktadır. Bu durum, diş hekimlerinin yaklaşımlarını hastanın yaşına göre uyarlamalarına yardımcı olabilir.

Anahtar Kelimeler: Üçüncü molar; diş çekimi; yaş; cinsiyet; tanı

Removal of the third molar remains one of the most common surgical procedures in oral and maxillofacial surgery.[1] Most of the studies on third molars involve only surgical extractions in oral and maxillofacial units and include patient populations of a certain age range.[2-4] However, surgical extraction may not be the main technique for third molar extraction at all ages. In a study not limited to an oral and maxillofacial surgery unit, they reported that the age of third molar extraction showed greater variation than previously reported.[5] The distribution of third molar extractions by age remains unclear. Third molar extraction data are derived indirectly from epidemiological studies of third molar presence.[6] There is a

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Peer review under responsibility of Turkiye Klinikleri Journal of Dental Sciences.

Received: 15 Jan 2024 ***Accepted:*** 06 Feb 2024 ***Available online:*** 12 Feb 2024

consensus that extraction of the third molars should be carried out when there are clinical and radiographic findings of pericoronitis, caries, periodontitis, pathology, or negative impact on the second molars and when it interferes with prosthetic or orthodontic treatment.[7] Prophylactic extraction of asymptomatically impacted third molars is controversial.[8] Dentists, other healthcare professionals and the public, including insurance companies and government organizations, continue to disagree about what circumstances warrant third molar extraction.[9-11] The age and indications for third molar extraction may vary in different populations because of genetics, demographics, socioeconomic status, oral hygiene, and treatment trends.[12-15]

The aim of this research was to investigate the patients' ages at the date of third molar extraction. Over a seven-year period, every third molar extraction carried out on patients of all ages by general and specialist dentists in a public hospital is investigated.

MATERIAL AND METHODS

In this research, the clinical records of the patients who applied for treatment at oral and dental health hospital were investigated retrospectively. Detailed information on treatments at each visit to oral and dental health hospital is recorded on a computer database. In this research, patients who applied to oral and dental health hospital for treatment between 2015 and 2022 and who had third molar extraction were included in the research.

Research data comprises the patient's age, gender, reason for extraction, method of extraction, registration of the tooth and jaw. Method of extraction is categorized as simple or surgical extraction. Reason for extraction was categorized as pericoronitis, dental caries, developmental odontogenic cyst, acute periodontitis, according to the 11th edition of the International Classification of Diseases.[16] The ages of the patients are subdivided into the following age groups: 10-19 years, 20-29 years, 30-39 years, 40-49 years, 50-59 years, 60-69 years, and 70 years and older.

Data processing is applied with STATA Version 17. The c^2 test was used to investigate variations in frequency between various age groups, genders, jaws, and method of extraction. p values 0.001 are chosen as the level of significance.

The ethics committee approval of the study was obtained with the decision of Health Sciences University Antalya Training and Research Hospital Clinical Research Ethics Committee dated June 30, 2022 and numbered 13/12. The study was conducted in accordance with the principles of the Declaration of Helsinki.

RESULTS

21,912 third molars were extracted over a 7-year period; 40.7% of the extracted teeth were in males and 59.3% were in females. The mean age of the patients was 30 years (standard deviation) 10.7, and the median age was 27 years. There was a sharp increase in the number of third molar extractions in late adolescence, with the peak years for extractions being 22, 23 and 24 years of age. Between the ages of 20 and 39, almost two-thirds of extractions were carried out. In the age group of 10-39 years, women predominate in third molar extractions, and from the age of 40 ($p<0.001$), men predominate. Of the third molars extracted, 27.5% were in the maxilla and 72.5% were in the mandible (Table 1). Although extraction rates in the maxilla increased with age, extraction rates in the mandible were dominant in all age groups ($p<0.001$). Most of the extracted third molars were surgical extractions with a rate of 64.4%, while 35.6% were simple extractions. Surgical extractions predominate in the 10-39 age group, and simple extractions predominate from the age of 40 onwards (Table 2) ($p<0.001$).

The frequent reasons for extraction were diseases of pericoronitis (49.6%), dental caries (44.6%), developmental odontogenic cyst (4.4%), and acute periodontitis (1.4%). Pericoronitis is predominant in the age group between 10 and 39 years, whereas dental caries are predominant from the age of 40 years (Figure 1).

DISCUSSION

In a systematic review of third molar extraction difficulties, Akadiri and Obiechina reported that although other variables such as gender, weight, body

TABLE 1: Distribution of the third molar extraction broken down into age group by gender, jaw, and method of extraction.

	Gender		Jaw		Method of extraction		
Age group (years)	Men (%)	Women (%)	Maxilla (%)	Mandible (%)	Surgical extraction (%)	Simple extraction (%)	Total n (%)
10-19	28.9	71.1	19.4	80.6	84.3	15.7	2,306 (11)
20-29	35.9	64.1	26.2	73.8	71.9	28.1	10,528 (48)
30-39	46.3	53.7	29.5	70.5	55.9	44.1	5,525 (25)
40-49	51.1	48.9	32.2	67.8	44.7	55.3	2,131 (10)
50-59	55.8	44.2	33.4	66.6	37.5	62.5	949 (4)
60-69	63.6	36.4	35.3	64.7	41.9	58.1	360 (2)
70+	69.0	31.0	49.6	50.4	47.8	52.2	113 (1)
Total	40.7	59.3	27.5	72.5	64.4	35.6	21,912 (100)
p value	<0.001		<0.001		<0.001		

TABLE 2: Distribution of the third molar extraction broken down into gender, jaw, and method of extraction by age group.

	Gender		Jaw		Method of extraction		
Age group (years)	Men (%)	Women (%)	Maxilla (%)	Mandible (%)	Surgical extraction (%)	Simple extraction (%)	Total n (%)
10-19	7.5	12.6	7.4	11.7	13.8	4.7	2,306 (11)
20-29	42.3	52.0	45.8	48.9	53.6	37.9	10,528 (48)
30-39	28.6	22.9	27.1	24.5	21.9	31.3	5,525 (25)
40-49	12.2	8.0	11.4	9.1	6.7	15.1	2,131 (10)
50-59	5.9	3.2	5.3	4.0	2.5	7.6	949 (4)
60-69	2.6	1.0	2.1	1.5	1.1	2.7	360 (2)
70+	0.9	0.3	0.9	0.4	0.4	0.8	113 (1)
p value	<0.001		<0.001		<0.001		

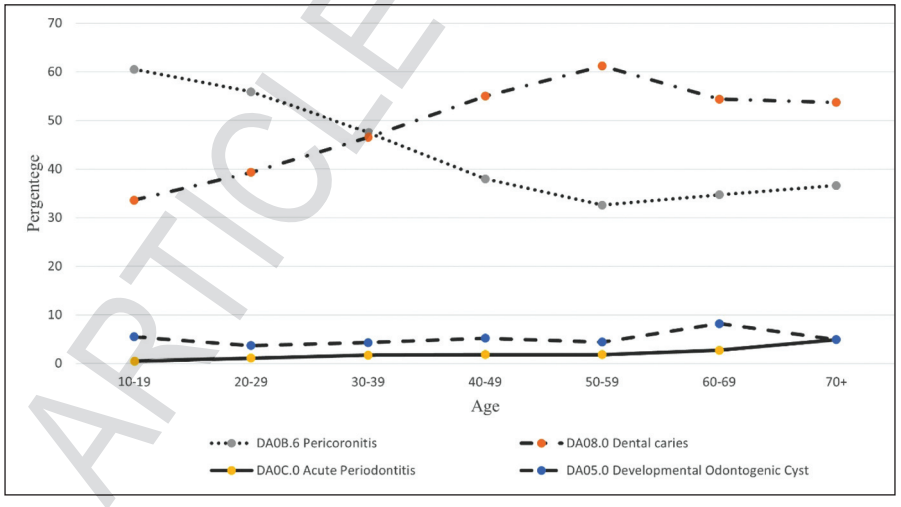

FIGURE 1: Age group distribution of reason for extraction.

mass index and ethnicity were documented in various studies, age was the only factor influencing difficulty at the multivariate level, and the mean age range of the seven studies analysed in the systematic review was between 26.2 and 28 years.[17] In a study evaluating the correlation of indications for surgical removal of impacted mandibular third molars with age, gender, and type of impaction, the median age was reported to be 31.54 years.[18] Kautto et al. reported a mean age of 34 years for the combined pa-

tient groups, which involved both specialist and general dental units in their study.[5] In a study conducted by Chan et al. to investigate the relationship between race and ethnicity on the age and complications of third molar extraction; they found that age at third molar extraction varied between racial/ethnic groups and the overall sampled population. They also found that public insured patients had third molars removed at an earlier age compared with the privately insured.[13] In this study, the mean age was 30 years, which was lower than in the study by Kautto et al.[5] Although the peak age was similar across studies, the increasing number of studies conducted in dental hospital populations rather than just oral surgery units may increase the variability of mean and median ages.

Olze et al. investigated the effect of ethnicity on third molar eruption and found that the earliest third molar eruption was observed in African populations, followed by German and Japanese populations.[19] It is possible that differences in developmental characteristics between populations may influence the age of third molar extraction. Lack of preventive dental care and oral hygiene may lead to increased symptoms requiring earlier extraction. The age of patients at the date of extraction of the third molar may vary due to many reasons such as eruption date, eruption status, dental care and oral hygiene status, dentist's opinion, insurance policy, differences in patients' perspectives on treatment between societies, differences in treatment policies of doctors due to guidelines, general opinion, and experience, etc.

Kautto et al. reported that maxillary third molars were extracted more frequently than mandibular third molars before the age of 40. However, an equal number of teeth were extracted from both jaws. In this study, mandibular tooth extraction was more common than maxillary tooth extraction, with an overall rate of 72.5%, which was higher in all age groups.[5] The epidemiological study by Magraw et al. showed an age-related female predominance, also in all age groups men are more likely to have more third molars than women up to the age of 70, which allows us to assume that women have more extractions than men.[6] Kautto et al. reported that the number of third molars extracted was similar in men and women.[5] In this study, both overall and for those aged under 40, women have higher extraction rates.

Susarla and Dodson reported that 24% of the extractions in their study were simple extractions.[20] Eklund and Pittman reported that almost all third molars extracted in patients aged 16 years and younger were surgically extracted and that the prevalence of surgical extraction decreased with increasing age to under 50% after the age of 23 years.[21] In the study by Kautto et al., simple extractions were found to be more common than surgical extractions, with surgical extractions decreasing in the 30-40 age group and being replaced by simple extractions.[5] As opposed to the study by Kautto et al., in this study surgical extractions were carried out more frequently than simple extractions, with a rate of 64%. The age at which simple extractions replaced surgical extractions was 40-49 years in this study.[5]

Fuster Torres et al. evaluated the indication for third molar extraction as determined by the primary care dentist and oral surgeon and aimed to compare the reason for extraction with the main reason for patient consultation. According to this study, both the primary care dentist and oral surgeon stated that the main indication for third molar extraction was prophylaxis, followed by for reasons of orthodontic treatment. When accompanying clinical symptoms or signs were observed, the most common indication given by oral surgeons was pericoronitis, followed by caries; this order was reversed for extraction by the primary care dentist.[22] Eklund and Pittman reported that third molars are referred to by general dentists and paediatric dentists and almost 90% are extracted by oral surgeons.[21] McArdle and Renton conducted a study to assess the impact of British national institute for health and care excellence guidelines on changes in clinical practice based on the number of patients third molar extraction, indications for extraction and patient demographics over the last 20 years before and after introducing guidelines.[23] In a study conducted by McArdle et al. to investigate the clinical features of mandibular third molars requiring extraction and to compare the features of impacted and unimpacted mandibular third molars, the mean age of patients with pericoronitis was 27 years, with caries 36 years, and with periodontal disease 46

years. Pericoronitis was detected in 49%, caries in 27% of the patients. As an indication for extraction, caries and related diagnoses occur on average in older age than pericoronitis.[24] van der Linden et al., in their study investigating the relationship between radiographic pathology and third molars, reported that the most common radiographic problem was caries, followed by supernumerary teeth, reduced alveolar height and coronal radiolucency.[25] In their study to investigate the prevalence of third molars and to report the distinction in the prevalence of third molar by jaw and demographic characteristics, Magraw et al. reported that the number of third molars, common in young adults, decreased in each successive age group and that demographic differences were present.[6] In a study conducted to measure the prevalence of disease in mandibular third molars referred for extraction, Knutsson et al. reported pericoronitis in 64% of cases, third molar caries in 31%, periodontitis in 8%, second molar caries in 5% and second molar root resorption in 1%.[26] Kautto et al. reported that caries, pulpal, periapical, gingival, and periodontal diseases were more common in older age groups, while impaction and pericoronitis were the main diagnoses in younger age groups but previous studies have shown similar age-related changes, but these were commonly based on data from mandibular third molars involving only oral and maxillofacial surgery units.[5] In this study, pericoronitis was the leading reason for extraction in younger age groups. In older age groups, caries is the leading reason for extraction. The reason for extraction of caries increases with age, replacing pericoronitis as the most common reason for extraction after the age of 30. In contrast to the study by Kautto et al., which involved general dentists, this study found related results to studies conducted in oral and maxillofacial surgery clinics, except for the relationship between the rate of mandibular and maxillary third molars. There are general differences between oral and maxillofacial surgical units and units where general dentistry is practiced in terms of intervention in third molar extractions. In general dentistry units, simple and easy surgical extractions are carried out. It can be assumed that the main reason for the difference in the age of extraction between oral and dental hospitals and oral and maxillofacial surgery units is that surgical units only perform surgical extractions. Although the peak extraction age of occurrence was consistent across many studies, the increasing number of studies conducted in dental hospital settings, not just oral surgery units, may lead to a greater divergence of mean and median ages.

CONCLUSION

This study highlights the importance of age in third molar extraction and the differences in extraction methods and gender distribution between different age groups. This may help dentists to adapt their approach according to the age of the patient.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

This study is entirely author's own work and no other author contribution.

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