EurAsian Journal of Oral and Maxillofacial Surgery
Official Publication of AÇBİD
(Association of Oral and Maxillofacial Surgery Society)

May 2024 Volume 3 Number 2
e-ISSN: 2687-5497

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RESEARCH ARTICLE

Knowledge and Self-Confidence of Dental Students and Newly Graduated Dentists About Dental Implants: An Online Survey

Gökhan Gürses[1], Fulya Idil Omeroglu Akkoc[2], Ahmet Aktı[3]

[1] Assistant Professor, DDS, PhD, Selçuk University, Dentistry Faculty, Oral and Maxillofacial Surgery Department, Konya, Turkey

[2] Private Practioner, DDS, PhD, Antalya, Turkey

[3] Assistant Professor, DDS, PhD, Selçuk University, Dentistry Faculty, Oral and Maxillofacial Surgery Department, Konya, Turkey

ABSTRACT

Introduction: Dental implant treatment is no longer a privileged method for rehabilitating missing teeth. Dental students and newly graduated dentists should have enough knowledge to direct patients to the proper treatment method. Our study aims to evaluate dental students' and newly graduated dentists' knowledge and self-confidence levels.

Materials and Method: This study is conducted as an online survey. The participants were invited by open invitation posts on various social media applications. The survey has fifteen questions; two are about demographic features, and the remaining thirteen are about dental implants.

Results: 259 participants have valid answers. 45% feel moderately knowledgeable about implant procedures. Males were significantly feeling informed about dental implants. Female participants think there is a significantly higher need for a specialist to do dental implant surgery than males.

Conclusion: It is necessary to increase the theoretical and practical courses in faculties. Thus, dental students and newly graduated dentists can provide the required knowledge to guide patients in choosing the appropriate treatment method.

Keywords: dental education, dental implant, dental student, knowledge, self-confidence

INTRODUCTION

In today's modern dentistry, especially with the introduction of the concept of osseointegration, implant treatment has become very popular. Significant developments have occurred quickly in developing technology and industry. The implant material has undergone various modifications over the years and has begun to be produced in many different types and sizes[1]. The condition of the patient's alveolar ridge, bone quality, number of missing teeth, gingival disease, systemic condition, and physical factors are the criteria that should be evaluated while planning the implant treatment. In addition, financial, social, and psychological status are significant factors in deciding the treatment type[2]. Although only some dentists prefer to apply implant treatment, they should have sufficient knowledge about dental implants and accurately inform and guide patients[3]. The dental implant subject is among the senior year courses in the "Turkish dental education core curriculum." the 4th and 5th-grade students join the implant operations as assistants. Dentistry faculty 4th and 5th-grade students and newly graduated (maximum two years) dentists should have enough knowledge to inform patients about implant therapy

Submission Date: January 12, 2024
Acceptance Date: February 5, 2024
Corresponding author: Gökhan Gürses
Address: Akademi, Selçuk Üniversitesi Diş Hekimliği Fakültesi. Alaeddin Keykubat Kampüsü, İsmet Paşa Cd. No:309, 42250 Selçuklu/Konya/Turkey
Phone: 0505 259 53 59 **Email:** gokhangurses.akademik@gmail.com

EurAsian Journal of Oral and Maxillofacial Surgery
Official publication of AÇBİD (Association of Oral and Maxillofacial Surgery Society)

It is the faculty's responsibility to provide practical training as well as theoretical education[4]. However, the two most important factors that prevent all practical applications for a bachelor's degree are that students need more time to do all the practical applications in each department, and many faculties' infrastructures need to be more suitable.

In this study, we aim to evaluate the levels of knowledge and self-confidence among dental students and newly graduated dentists regarding dental implants.

MATERIALS AND METHOD

Selcuk University Faculty of Dentistry Research and Ethics Committee reviewed and approved the study (2020/27). As the study population, 4th and 5th-grade dental students and dentists less than two years after graduation were targeted. The participants were invited by open invitation posts on various social media applications. Our study was adapted from a questionnaire that evaluates implant-related education, knowledge, abilities, and preferences among undergraduate students at the University of Barcelona[3].

The survey form consisted of 15 questions; the first two questions were about gender and educational information. The other parts included 13 questions to evaluate their participants' attitude and knowledge of implant procedures.

The SigmaPlot 14 program was used for the statistical evaluation of the data. Descriptive analysis was performed for all answers. Proportions and frequencies were obtained. Significant differences between proportions were searched via Chi-square and Fisher exact test. We set the confidence interval to 95%, and $p < 0.05$ was considered statistically significant.

RESULTS

A total of 351 participants joined our online survey. The 259 participants (157 female and 102 male) answered all fifteen questions. We excluded from the study those who did not answer all questions. The 119 participants were 4th-grade students, 94 were 5th-grade students, and 46 are dentists whose graduation date was less than two years.

We compared the level of feeling knowledgeable about implant procedures between male and female students; the level of feeling knowledgeable by male students was higher (p=0.024). The same comparison was made between academic degrees; no significant difference was found (p=0.873). The evaluation of implant placement difficulty levels between the academic degrees and genders showed no significant difference (p= 0.149, p=0.458, respectively).

A statistically significant difference was found when evaluating the necessity for a specialist in implant surgery based on gender. Specifically, females indicated a belief that specialists are required for dental implant placement ($p < 0.001$).

All questions and frequency and percentage of answers are shown in Table 1.

DISCUSSION

Due to the rapid spread of dental implant treatments today, newly graduated dentists encounter more patients demanding dental implants. General practitioners should know the indications for implant treatment and learn to refer the patient to a specialist if necessary[5]. In addition, the general practitioner must be competent in assessing clinical situations and presenting different treatment options to patients. In cases of peri-implantitis, the student should be familiar with appropriate interventions[4]. Many dentistry schools in the United States allow senior pre-doctoral students to perform single implants and over-implant restorations[6].

In dentistry undergraduate education, dental implant courses are given by oral and maxillofacial surgery, prosthodontics, and periodontology departments. After undergraduate education, there is no qualification requirement to perform dental implant surgery. Therefore, dental implant training is limited to theoretical lessons due to insufficient infrastructure, time, and academic personnel. In these circumstances, we aimed to reveal the students' knowledge about dental implants and how knowledgeable they felt.

In this study, it was seen that most of the survey participants felt moderately knowledgeable, with a rate of 45%, similar to studies conducted in India[7,8]. These studies show that the implant education provided during the undergraduate period in both countries needs to be improved for the students. The educational system and curriculum of dentistry education can cause insufficient knowledge of dental implants because India's dentistry education system is similar to that in Turkey[9]. In another study conducted in Nepal, 56% of the students stated that they were moderately knowledgeable[10].

EurAsian Journal of Oral and Maxillofacial Surgery
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Table 1. Survey questions and the frequency and percentages of the answer given by the participants

Question 1- Gender	Frequency	Percent
Female	157	60,6
Male	102	39,3
Question 2- Academic Degree		
4th Class	119	45,9
5th Class	94	36,2
Newly Graduated	46	17,7
Question 3- Level of feeling knowledgeable about dental implants		
Very well	11	4,2
Well	96	37
Moderate	119	45
Poor	31	11
I have no idea	2	0,7
Qestion 4-Difficulty level of implant placement		
1(so easy)	3	1,2
2	2	0,8
3	9	3,5
4	27	10,4
5(moderate)	53	20,5
6	58	22,4
7	57	22
8	41	15,8
9	5	1,9
10(very difficult)	4	1,5
Question 5-The biggest advantage of the implant among other missing tooth treatment methods		
The most aesthetic method	23	8.883
More conservative treatment	154	59
Long time survive	79	30
No extra advantage	2	0,7
No idea	1	0
Question6-The most important factor in implant success		
Case selection	125	48
Implant type and material	40	59
Patient cooperation	17	6,6
Surgery techniqe	23	8,9
Dentist experience	53	20
No idea	1	0,4
Qestion 7-How long will the implant survive?		
2-5 year	8	0,09
5-10 year	77	29,7
10-20 year	83	32
Lifetime	35	13
No idea	56	21
Qestion 8-Does the implant require more care than normal teeth?		
Requires more care than normal teeth	146	56
Same care as normal teeth	110	42
Requires less care than normal teeth	3	1,1
No idea	0	

EurAsian Journal of Oral and Maxillofacial Surgery
Official publication of AÇBİD (Association of Oral and Maxillofacial Surgery Society)

Qestion 9-Average cost of the implant to the patient		
1000-2000	30	11,6
2000-3000	102	39,4
3000-5000	108	41,7
5000 TL and up	19	7,3
Qestion 10-Do dental implants in Turkey offer an acceptable solution for the treatment of missing teeth?		
Yes	127	49
No,there are not economic	115	44,4
No,it is a very invasive procedure for the patient to accept	12	4
No, for other reasons	5	1,9
Question 11 - Do you think that you received sufficient training on implant treatment procedures in your dentistry education?		
Yes	236	91,1
No	23	8,9
Question 12- Do you think there should be more courses about implant procedures in the dental curriculum?		
Yes	236	91,1
No	23	8,9
Question 13-How do you think your level of knowledge about implant procedures will be when you graduate?		
I don't think I will have enough theoretical and practical knowledge.	147	56,8
I have enough theoretical knowledge but no experience	101	39
I have enough knowledge and experience to diagnose and treat myself	11	4,2
Qestion 14-Is it necessary for a specialist (surgeon or periodontologist) to perform the implant application?		
Yes	172	66,4
No	87	33,6
Qestion 15-Where would you like to receive training on dental implants?		
Short-term training or courses organized by implant companies	17	6,6
One of the 1-year certified training programs organized by universities or implantologists	128	49,4
Postgraduate programs or courses organized by universities	15	5,8
Internet-based training programs or videos	0	
By specializing in oral and maxillofacial surgery or periodontology	99	38,2

In studies comparing all academic degrees, the expectation that the level of knowledge would increase with the increase in academic degrees remained unrequited[13]. Accordingly, in our study, it has been observed that the responses given remain consistent regardless of academic degree. We compared the level of feeling knowledgeable about dental implant procedures between male and female students; male students exhibited statistically higher levels. (p=0.024). However, no significant result was found in the same comparison between academic degrees (p=0.873). This difference is because male participants are more courageous against surgical procedures, and most male students are likely to overestimate their skills[11].

According to the answers, participants' opinions regarding the difficulty level of implant placement are moderate to complex. 91.1% of the responses vary between 4 and 8. It is coherent with the study conducted in Barcelona[3].

59% of the participants believe the main advantage of dental implants is that they are more conservative. In the case of dental implant treatment, there is no preparation of adjacent teeth and, therefore, no damage to adjacent teeth[12]. In fixed partial dentures, the teeth lose substance with the preparation process, sometimes leading to endodontic, periodontal, and structural problems to achieve optimum aesthetic results [12]. Dental implant treatment offers many advantages over traditional fixed or removable prosthetic alternatives. The clinical success of implant treatment in edentulous and partially edentulous patients has been well demonstrated in studies[13,14].

EurAsian Journal of Oral and Maxillofacial Surgery
Official publication of AÇBİD (Association of Oral and Maxillofacial Surgery Society)

Case selection and management are critical factors in dental implant planning. Considering the opinions of the survey participants about the most crucial element in implant success, 48% stated that it was case selection. In a student study conducted in Spain, case selection was the critical factor, with a rate of 41%[3]. Similarly, in a survey conducted in India, 65.1% of the student participants answered case selection for essential factor questions[15].

In our study, 32% of the participants stated that the survival period of dental implants is 10-20 years, while 13% indicated that it is lifetime. The perception that implants survive a lifetime can lead to unrealistic patient expectations. There needs to be more evidence from extended follow-up studies (>20 years follow-up) of implant survival rates to help us answer this question. The belief that implants have a better long-term prognosis than teeth has been explicitly rejected in comparative studies and systematic reviews; even teeth with poor prognoses due to periodontal disease or endodontic problems can survive much longer than the average implant[16].

More than half of the participants (56%) thought implants require more oral care than natural teeth. After the implants are placed in edentulous areas, the clinicians should evaluate them with routine control appointments and radiographs to ensure regular maintenance and survival of their restorations. Providing hygiene in dental implants is crucial for long-term implant success and avoiding conditions such as periimplantitis[17].

Half of the participants (49%) said dental implants are acceptable for treating missing teeth, while 44.4% said they were not because the economic situation would limit their use. The studies conducted in Austria by Pommer et al.[18], in the United States by Zimmer et al.[19], in Japan by Akagawa et al.[20], and in India by Chowdhary et al.[21] have also highlighted patients' concerns regarding the increased cost of dental implants and reported that patients cited economic infeasibility as the main reason for not prefer dental implant treatment. Thus, there is concern among dentists alike that the high cost of dental implants may limit their usage[7].

86% of the participants think they need to receive adequate training on implant procedures in dentistry education. The training given about the implant is only a theoretical course and has no practical application in Turkey. Hands-on training is provided in specialization education or doctoral programs. Turkey is not the only country with no practical dental implant training. Spain's dental education curriculum consists of five-year theoretical and practical courses. The subject includes implant dentistry, entitled "advanced orofacial implantology," which can be taken during the fourth or fifth year. According to some surveys of undergraduate courses in dentistry conducted internationally at different Universities, the total number of teaching hours in implant dentistry varies between 10 and 40[3].

In the answers given to the question "What do you think your level of knowledge about dental implants will be when you graduate?", 56% of the participants stated that they needed more knowledge. Another survey with 21 questions was conducted among recent graduates to learn about their basic knowledge level. The study reached the same conclusions in most respects, confirming the lack of knowledge and confusion about issues such as indications and risk factors, with 78.8% of graduates considering that they did not receive adequate training in implants and 100% insufficient knowledge[22].

We asked whether a specialist (surgeon or periodontologist) should perform implant surgery, and 66.4% of the participants answered "Yes." We evaluated the same question based on gender, and a statistically significant difference was found in favor of females ($p<0.001$). Still, we compared between academic degrees, and no significant difference was found ($p:0.052$).

The contents of implant courses in undergraduate education in dentistry faculties in Turkey should be expanded. Studies investigating dental implant education given in different universities should be carried out. Opportunities should be provided for students to enhance their skills in practical dental implant education. Dental implant education should not solely be reserved for postgraduate studies; there should be an increase in theoretical courses on implants within undergraduate education.

CONCLUSION

Most participants are familiar with dental implants, but the percentage of unsatisfactory answers is also high. Therefore, increasing the theoretical and practical courses in faculties is necessary. Thus, dental students and newly graduated dentists can provide the required knowledge to guide patients in choosing the appropriate treatment method.

EurAsian Journal of Oral and Maxillofacial Surgery
Official publication of AÇBİD (Association of Oral and Maxillofacial Surgery Society)

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EurAsian Journal of Oral and Maxillofacial Surgery
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RESEARCH ARTICLE

Is Preemptive Analgesia Effective on Postoperative Complications Occurring After Impacted Third Molar Surgery under General Anaesthesia?

Muhammed Haşmet Türker[1], Hasan Onur Şimşek [2], Özlem Kocatürk [3]

[1] DDs, Private Clinics, İzmir, Turkey

[2] DDs PhD, Private Clinics, Aydın, Turkey

[3] MD, Department of Oral & Maxillofacial Surgery, Anesthesiology, Faculty of Dentistry, Aydın Adnan Menderes University, Aydın, Turkey

ABSTRACT

Introduction: In this study, it was aimed to investigate the effects of preemptive analgesia on postoperative pain severity, pain onset time, analgesic need, edema and trismus caused by impacted third molar surgery.

Material and Methods: ASA I-II group of patients who underwent third molar surgery under general anesthesia was given intravenous 0.3 mg/kg tenoxicam 20 minutes before the surgery and 20 minutes after the end of the surgery. The data records of the patients who were applied tenoxicam were examined regarding VAS values, and the presence of swelling and trismus, retrospectively.

Results: The VAS values in the preemptive group were significantly lower than the values in the group 2 at the postoperative 1st, 3rd and 6th hours ($p<0.05$). It was found that 36 patients (76.6%) in group 2, and 13 patients (31.0%) in group 1 needed additional postoperative analgesia. Trismus was observed in 28 patients (59.6%) in the group 2 and 6 patients (14.2%) in group 1. Analgesia time provided in the preemptive group was found to be significantly longer than the postoperative group ($p <0.05$).

Conclusion: We believe that preoperative analgesic application as part of multimodal analgesia in patients undergoing impacted third molar surgery under general anesthesia offers successful and reliable results in postoperative pain management.

Keywords: third molar surgery, preemtive analgesia, postoperative pain

INTRODUCTION

Impacted third molar surgery is one of the most performed operations in oral and maxillofacial surgery. Pain occurring after the surgical extraction of impacted wisdom teeth is a distressing problem for both the patient and the oral surgeon that affects the quality of life of patients. Various medications and methods are applied before and/or after the operation to prevent pain after surgical extraction.

The concept of preemptive analgesia minimizes postoperative pain by preventing central sensitization. Central sensitization due to tissue damage can be inhibited by the preoperative administration of an analgesic. Crile, who introduced the method of preemptive analgesia, advocated the use of regional blocks in addition to general anaesthesia to prevent intraoperative nociception caused by changes in the central nervous system during surgery.[1] Woolf, on the other hand, suggested that the administration of opioids or local anaesthetics before surgery

Submission Date: October 31, 2023
Acceptance Date: December 28, 2023
Corresponding author: Hasan Onur Şimşek
Address: Hasan Onur Şimşek, Private Clinic, Aydın/Turkiye
Phone: 0535 856 44 00
Email: hasanonursimsek@gmail.com

EurAsian Journal of Oral and Maxillofacial Surgery
Official publication of AÇBİD (Association of Oral and Maxillofacial Surgery Society)

may prevent intraoperative nociception caused by changes in the central nervous system during surgery, thereby reducing the intensity of postoperative pain.[2]

The purpose of preemptive analgesia is to prevent or reduce the occurrence of any pain memory in the nervous system and, in turn, the need for analgesia. This is considered as a successful method to suppress postoperative pain that will occur. For this purpose, opioids, local anaesthetics, COX-2 inhibitors, nonsteroidal anti-inflammatory drugs (NSAIDs) can be used as medication.[3]

This study aims to investigate the effect of preemptive analgesia on early postoperative pain control in patients who underwent impacted third molar surgery under general anaesthesia, as well as the effects of swelling and trismus, a natural result of the inflammatory process.

MATERIAL AND METHODS

Patient file records were selected from cases performed with general anesthesia under standard conditions in the Aydın Adnan Menderes University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery operating room. This study followed the recommendations of the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist. The study was approved according to the ethical rules of the Declaration of Helsinki by the Ethics Committee of Aydın Adnan Menderes University Faculty of Dentistry with the protocol number ADÜDHF2019/067, based on the opinion that it was not against the ethical rules.

The study retrospectively analysed patients who had undergone third molar surgery under general anaesthesia. The surgery was for asymptomatic, intraoral unexposed full mucous and/or bone retention. ASA [The American Society of Anaesthesiology] I-II patients who were applied routine anaesthesia protocol according to recorded file data matching the criteria were included in the study. Patients with symptoms of pain, swelling and/or infection before the operation, impacted teeth associated with pathological lesions, drug allergy, and uncontrolled systemic disease, multidisciplinary dental procedures, and records with missing data were excluded from the study.

Our routine general anaesthesia protocol was applied to all patients included in the study. In this protocol, following induction of anaesthesia by using 1 ug.kg-1 fentanyl, 2 mg.kg-1 propofol, and 0.8 mg/kg-1 rocuronium, patients were administered 1-2% volume of sevoflurane in 50% O_2 and 50% N_2O for maintenance of anaesthesia. After the patients were taken to the recovery room following extubation after surgery, all hemodynamic parameters (ECG, NIBP, SpO2), vital signs, and early postoperative complications were recorded.

Tenoxicam, which is a nonsteroidal anti-inflammatory drug, was used as analgesic medication. According to the preferred postoperative pain management modalities, patients were divided into two groups based on the information regarding the time of application of Tenoxicam. Patients who were applied Tenoxicam 0.3 mg/kg-1 20 minutes before the start of surgery were defined as the Group 1-preemptive group, and those who were applied 20 minutes after the end of the surgery, i.e. conventionally, were defined as the Group 2-postoperative group. To assess the effect of analgesia modality on pain in hourly follow-ups in the early postoperative period, the records in patient files regarding VAS values, presence of pain and pain onset time, additional analgesic requirements, as well as the presence of swelling and trismus were used.

The visual technique of VAS (Visual Analogue Scale) was used to measure the pain level. With the inclusion of asymptomatic teeth in the preoperative period, the patient's preoperative VAS score was assumed to be 0. As for pain levels for each individual, values recorded at the 1st, 3rd, and 6th hours from postoperative routine hourly measurements were used. While evaluating the presence of pain in the early postoperative period, the patients with VAS pain score 0 at the end of the first 6 hours were categorized under the heading 'pain absent', and those with a value other than 0 in the first 6 hours were categorized as 'pain present'. Postoperative analgesics applied after the recovery period of the patients were expressed in the file data as 'present' or 'absent' under the heading "additional analgesic requirements". In the patient file data, pain onset time records, which indicate the termination of the analgesic effect, were used to evaluate this parameter.

The presence of trismus was defined by considering preoperative and postoperative mouth opening measurements specified by the determination of incisal edge distance between the maxillary and mandibular 1st incisors by means of the digital calliper in millimetres, as well as expressions indicating restriction to mouth opening, and records of feeding difficulty related to mouth opening that were in patient file data. Patients were categorized as 'trismus present' and 'trismus absent' by

EurAsian Journal of Oral and Maxillofacial Surgery
Official publication of AÇBİD (Association of Oral and Maxillofacial Surgery Society)

considering the measurements in the data and expressions of mouth opening restriction.

VAS method was used to assess edema after surgical procedure. VAS edema scores recorded in the 6th postoperative hours were used in postoperative edema size determination. At the postoperative 6th hour, a value between 1 and 3 was used for postoperative edema size determination, as "1 = No/ mild swelling" - "2 = moderate swelling" - "3 = severe swelling" (Table 1).

Table 1. Expressions Used in the Evaluation of Edema

1- Mild Swelling	No swelling/There is mild swelling but not noticeable
2- Modarete Swelling	Swelling is noticeable but does not hinder chewing movements much
3- Severe Swelling	Swelling is noticeable and severely restricts chewing function

Statistical analysis

Statistical analysis was performed using SPSS (version 18.0, SPSS Inc., Chicago, Illinois, USA). The normal distribution assumption of the data was checked with the Kolmogorov-Smirnov test. Correlations between categorical variables were analysed by the Chi-squared test. Comparisons between groups were analysed using the Mann-Whitney U test. Descriptive statistics were presented as SD and interquartile range (IQR), number and percentage, quantitative and categorical variables, and mean, respectively. A p-value of <0.05 was considered significant for all comparisons.

RESULTS

Archives of a total of 89 patients, 46 males, and 43 females were included in the study. Flowchart of the patients in the study formed according to the inclusion criteria is shown in figure 1.

The fact that no statistically significant difference was found (p>0.05) between postoperative and preemptive groups in terms of the distribution of the duration of surgery from the incision to the performance of the final suture, the number of operated teeth, the tooth, and jaw relationship that indicates the position of the jaw where the impacted third molar teeth were operated, and the dental retention type of the

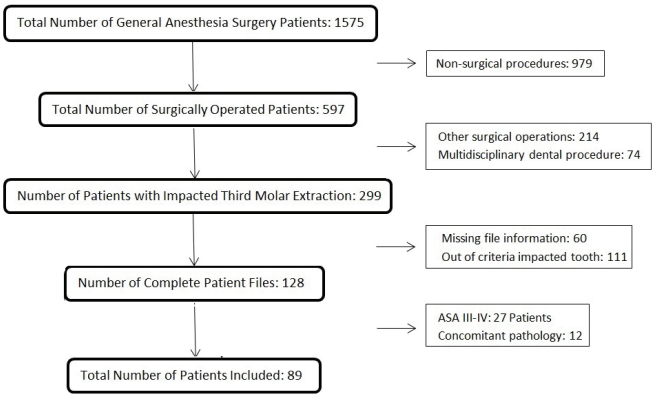

Figure 1. Flowchart of the patients in the study formed according to the inclusion criteria

impacted teeth that were operated was evaluated in favor of standardization in the study regarding the effect of surgical factors on postoperative early period pain severity. This, in turn, was evaluated in favor of standardization in terms of assessing postoperative early period pain management with different analgesic methods in patients who underwent impacted third molar surgery under varying general anaesthesia.

The patient age range in the selected archives is 22-36. Table 2 summarizes the mean and p values of the demographic data. There was no statistically significant difference between postoperative and preemptive groups in terms of age, gender, body weight, ASA classification (p>0,05). This, in turn, was evaluated in favour of standardization in terms of assessing postoperative early period pain management with different analgesic methods in patients who underwent impacted third molar surgery under varying general anaesthesia.

Table 3 contains information about the operated teeth. The distribution of teeth in the maxilla and mandible, the number of teeth extracted per patient and the impaction status of the teeth are seen.

Table 4 summarizes the mean and p values of the postoperative data in our study. According to the preference of the postoperative analgesic method, the VAS pain values recorded at 1st hour show a statistically significant difference (p <0.05). The VAS pain values at the 1st hour in the postoperative group were statistically significantly higher than the preemptive group.

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Table 2. Demographic data of Preemptive and Postoperative groups

		Group1 (Preemptive) (n = 42)	Group2 (Postoperative) (n=47)	p value
Age (years)		27.0 (22.0-34.0) 28.62 ± 8.51	29.0 (23.0-36.0) 30.94 ± 9.60	0.934
Body Weight (kg)		65.0 (59.5-75.3) 67.45 ± 11.05	70.0 (58.0-77.0) 67.23 ± 31.42	0.234
Gender	Female	21 (50%)	22 (46.8%)	0.101
	Male	21 (50%)	25 (53.2%)	
ASA	I	31 (73.8%)	34 (72.3%)	0.934
	II	11 (26.2%)	13 (27.7%)	

P<0.05 value was considered statistically significant

Table 3. Teeth distributions of Preemptive and Postoperative groups

		Group1 (Preemptive) (n = 42)	Group2 (Postoperative) (n=47)	p value
Number of teeth of the patient		1.31 ± 0.75	1.36 ± 0.81	0.751
Impacted Teeth	Bone	26 (61.9%)	36 (76.6 %)	0.234
	Mucosal	16 (38.1%)	11 (23.4%)	
Teeth - Jaws	Maxilla	12 (22.2%)	18 (28.1%)	
	Mandible	42 (77.8%)	46 (71.9%)	
	Total	54	64	

P<0.05 value was considered statistically significant

Table 4. Postoperative data of preemptive and postoperative groups

		Group1 (Preemptive) (n=42)	Group2 (Postoperative) (n = 47)	p value
Postoperative pain (VAS) 1st hour		0.0 (0.0-0.0) 0.15 ± 0.02	0.0 (0.0-1.0) 0.54 ± 0.28	0.003
Postoperative pain (VAS) 3rd hour		0.0 (0.0-2.0) 1.06 ± 0.88	1.0 (2.0-3.0) 1.85 ± 1.21	<0.001
Postoperative pain (VAS) 6th hour		2.0 (1.0-2.3) 1.86 ± 1.37	4.0 (2.0-6.0) 3.89 ± 1.77	<0.001
Pain onset time		3.0 (3.0-5.0) 3.78 ± 0.95	3.0 (1.3-3.0) 2.77 ± 1.29	0.002
Early postoperative period presence of pain	Absent	19 (45.2%)	3 (6.4%)	<0.001
	Present	23 (54.8%)	44 (93.6%)	
Additional analgesic requirement	Absent	29 (69.0%)	11 (23.4%)	<0.001
	Present	13 (31.0%)	36 (76.6%)	
Swelling	Mild	23 (54.8%)	17 (36.2%)	0.020
	Moderate	17 (40.5%)	18 (38.3%)	
	Severe	2 (4.8%)	12 (25.5%)	
Trismus	Absent	36 (85.7%)	19 (40.4%)	<0.001
	Present	6 (14.3%)	28 (59.6%)	

p <0.05 value was considered statistically significant.

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While the mean VAS pain score record at the 1st was 0.54 ± 0.28 in the postoperative group, it was 0.15 ± 0.02 in the preemptive group. When the VAS pain values recorded at the 3rd hour are considered, the mean VAS pain score record was 1.85 ± 1.21 in the postoperative group and 0.15 ± 0.02 in the preemptive group. The VAS pain values at the 3rd hour in the postoperative group were statistically significantly higher than the preemptive group (p<0,05). When the VAS pain values recorded at the 6th hour are considered, the VAS values at the 6th in the postoperative group were statistically significantly higher than the preemptive group (p<0,05). When compared between groups, the mean 6th-hour VAS pain score record was found 3.89 ± 1.77 in the postoperative group, and 1.86 ± 1.37 in the preemptive group. When the hourly VAS pain scores were evaluated and the presence of early postoperative pain was examined, 44 patients had pain and 3 patients had no pain in the postoperative group, whereas 23 patients had pain and 19 patients had no pain preemptive group. Between the groups, the presence of early postoperative pain is statistically significantly higher in the postoperative group than in the preemptive group (p<0,05) (Figure 2).

When the pain onset time was evaluated, the mean pain onset time in the postoperative group was found as 2.77 ± 1.29 hours, and it was 3.78 ± 0.95 in the preemptive group. The preferred postoperative analgesic method shows a statistically significant difference (p<0,05). The time provided for analgesia in the preemptive group was statistically significantly longer than the postoperative group.

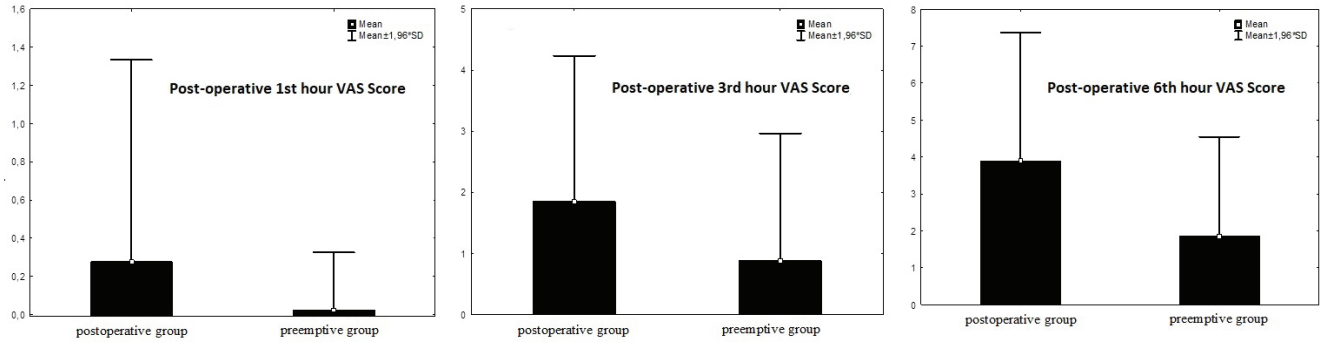

Figure 2. Postoperative VAS scores of preemptive and postoperative groups (A: 1st hour; B: 3rd hour C: 6th hour)

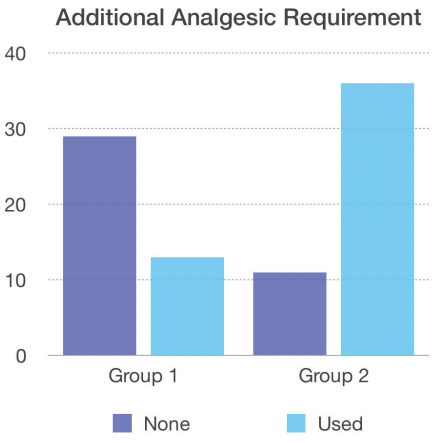

Figure 3. Additional analgesic requirements of preemptive and postoperative groups in the first 6-hour period

According to the preference of the postoperative analgesic method, additional analgesic requirement in the first 6-hour period was statistically significantly higher in the postoperative group compared to the preemptive group (p<0,05). In the postoperative group, 36 patients required additional analgesia and 11 patients did not, while in the preemptive group, 13 patients required additional analgesia and 29 patients did not (Figure 3).

In the postoperative group, 17 mild, 18 moderate, 12 severe edema values were found, whereas, in the preemptive group, 23 mild, 17 moderate and 2 severe edema were scored. The amount of postoperative edema in the postoperative group is statistically significantly higher than in the preemptive group (Figure 4).

EurAsian Journal of Oral and Maxillofacial Surgery
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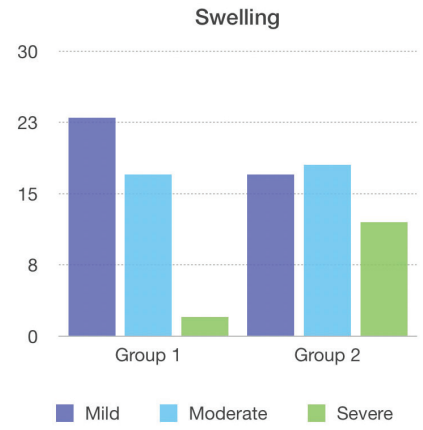

Figure 4. Postoperative edema values of preemptive and postoperative groups

According to the preference of the postoperative analgesic method, trismus shows a statistically significant difference ($p<0,05$). In the postoperative group, a total of 28 patients had trismus after surgery and 19 patients had none. In the preemptive group, 6 patients had trismus after surgery and 36 patients had none. According to our evaluation, the amount of trismus after surgery in the postoperative group is significantly higher than the preemptive group (Figure 5).

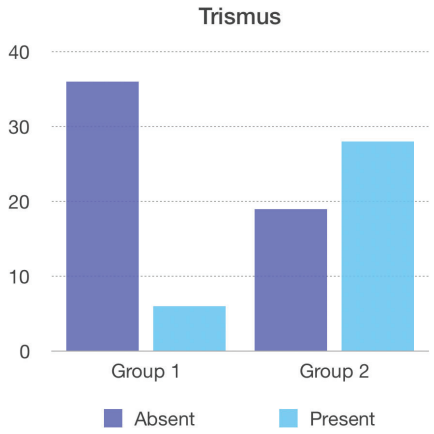

Figure 5. Postoperative presence of trismus in preemptive and postoperative groups

DISCUSSION

Third molars have the highest incidence of impacted teeth, and postoperative complications on these teeth extraction are among the most common conditions encountered by oral and maxillofacial surgeons.[4] The preemptive analgesia method, which is one of the pain management modalities, can be used to prevent or minimize the pain that occurs after the extraction of the impacted third molar.[5] Preemptive analgesia application is defined as the treatment that prevents the occurrence of central sensitization caused by incisional and inflammatory injuries.[6] The prevention of central sensitization, which is aimed with the preemptive application of drugs, begins before the incision and continues during the surgery and in the postoperative period. Thus, physiological pain can be treated and pathological pain can be prevented. In a study conducted by Kara et al. with 50 patients scheduled for graft/flap repair, it was determined that preemptive dexketoprofen administration kept postoperative VAS pain score and extra tramadol consumption lower.[7]

NSAIDs are frequently used as an alternative to opioids in preemptive analgesia applications. Various studies indicate that the quality of postoperative analgesia increases when NSAIDs are applied pre-emptively.[8] Tenoxicam is a long-acting, IV NSAID agent which is frequently used in mild and moderate pain, and also an oxicam derivative. NSAID application can provide effective analgesia in the postoperative period [9].

Postoperative pain severity reached the maximum level in the first 6 to 12-hour period.[5,10] In our study, we examined the measurement scores at the 1st, 3rd and 6th hours, by taking into consideration the pain reaching the maximum level in the early postoperative period and similar applications in the literature and using the registered VAS scales of the patients. In their study on 41 patients undergoing laparoscopic cholecystectomy, Yağar et al. applied tenoxicam 40 mg iv to patients 30 minutes before surgery and at the end of the surgery, and compared their effectiveness on postoperative pain, and stated that preemptive application does not change pain perception compared to the application at the end of surgery. [11] İlhan et al. compared the effects of methylprednisolone and tenoxicam on pain, edema and trismus after mandibular third molar extraction and observed that tenoxicam was more effective in postoperative pain control.[12] They reported that preemptively applied tenoxicam provided better analgesia than the one applied after induction. This conclusion is supported

EurAsian Journal of Oral and Maxillofacial Surgery
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by the fact that, according to the statistical results obtained in our research, when considered separately, the VAS pain measurement values at the 1st, 3rd and 6th hours of the patients in the group who were applied preemptive tenoxicam were statistically significantly higher than the VAS data at the 1st, 3rd and 6th hours in the postoperative group.

There are a limited number of studies evaluating the parameter pain onset time. In their study evaluating the effects of preemptive gabapentin and preemptive pregabalin application on postoperative early neuropathic pain management in 60 patients, Saraswat et al. reported that these applications provided effective analgesia, and effective analgesia times were achieved.[13] As a result, it was determined that the postoperative analgesic duration of preemptive tenoxicam application was significantly extended and the requirement for additional analgesic was significantly reduced. The statistical results of our study have also followed a similar trend. Postoperative early period pain onset times were significantly higher in the group of patients with preemptive analgesia application compared to the postoperative group. In our study, an additional analgesic requirement in the postoperative group in the early postoperative period was significantly higher than the preemptive group supports this effect of preemptive analgesia.

The data related to the edema that occurred as a natural result of the inflammatory process along with postoperative pain were also included in the study. In our study, VAS edema scores recorded at the postoperative 6th hour were used to determine the amount of edema. In their study conducted on 60 patients to evaluate the effect of the preemptive application of diclofenac sodium on postoperative pain, trismus, and edema occurring after impacted third molar extraction, Shah et al. found that it was more effective in postoperative pain management, but did not provide effective management in the amount of edema and trismus.[14] Cebi et al. examined the effect of diclofenac sodium and tenoxicam on trismus and edema after impacted third molar surgery and reported that tenoxicam provided more effective control.[15] According to the statistical results of our study, the fact that postoperative edema amount was significantly higher in the postoperative group compared to the preemptive group confirms the effect of preemptive analgesia on managing the inflammatory process in the early postoperative period.

Trismus is very strongly related to postoperative pain, therefore it is stated that pain is among the most important causes of the occurrence of trismus. Hupp claimed that postoperative edema and trismus are not related to the duration of surgical intervention, but postoperative trismus was caused by the pain after surgery. The restriction to mouth opening, which starts after molar surgical procedures, increases and reaches the maximum level on 1st and 2nd days.[16] In our study, after the termination of surgical intervention, the myorelaxant effect of the agent applied during the routine general anaesthesia procedure was antagonized with the application of atropine and neostigmine to the patients, and the myorelaxant effect factor of the intraoperative medication on postoperative trismus was thus excluded. In their study involving 29 patients, Moore et al. examined the effect of the preemptive application of rofecoxib and dexamethasone on trismus and pain occurring after impacted third molar surgery, and reported that these provided effective management.[17] Considering the statistical findings in our study, the difference between the trismus presence data of the patients in the preemptive group and the patients in the postoperative group shows that preemptive anaesthesia application provides effective management over trismus.

The effectiveness of postoperative analgesia is directly related to the severity of complications, regardless of preferred pain management modalities. In this regard, the type and duration of surgery, the extent of tissue damage, the presence of infection, the relationship of the tooth with the alveolar canal, the type of impacted tooth retention, the physiological and psychological state of the patient are among the factors.[18] Many of these are difficult to control in studies. The retrospective nature of the article can be seen as a limitation of the study. Due to the data loss, the number of patients was limited. Among the limitations of our study are that maxillary and mandibular surgical procedures were included in the same evaluation in the patient file selections made in our study, that the operations were not performed by the same surgeon in terms of physician experience factor directly affecting the surgical time. In future studies, increasing the number of patients by conducting prospective studies will increase the power of the article.

CONCLUSION

Preemptive analgesic applications used in the management of postoperative pain are gradually becoming established in routine dentistry practice. In addition, we concluded that

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it postpones pain onset time, reduces additional analgesic requirement, and decreases the amount of trismus and edema. Therefore, we believe that preoperative analgesic application as part of multimodal analgesia in patients undergoing impacted third molar surgery under general anaesthesia offers successful and reliable results in postoperative pain management.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author contributions

All authors read and approved the final manuscript. M.H.T.: Acquisition, interpretation and analysis of data, Study coordination, manuscript drafting of manuscript. H.O.Ş.: Conception, and design of intellectual and scientific content of the study, interpretation, and analysis of data; manuscript writing. Ö.K.: Conception, and design of intellectual and scientific content of the study, Interpretation and analysis of data, manuscript writing, critical revision.

Declaration of Competing Interest

None.

Patient consent

Not required.

ACKNOWLEDGMENTS

We would like to thanks to the staff and dental assistants, including our colleagues at the Department of Oral and Maxillofacial Surgery.

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EurAsian Journal of Oral and Maxillofacial Surgery
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REVIEW ARTICLE

Mandibular Kondiler Hiperplazi: Tanı ve Tedavi

Şeyma Kale[1], Berkan Altay[2]

[1] DDS, Resarch Asistant, Department of Oral and Maxillofacial Surgery, Kütahya Health Sciences University, Kütahya, Turkey
[2] Asst. Professor, Department Head, Department of Oral and Maxillofacial Surgery, Kırıkkale University, Kırıkkale, Turkey

ÖZET

Kondiler hiperplazi (KH) kondillerin aşırı büyümesiyle karakterize bir durumdur. KH'nin etyolojisi tam olarak bilinmemektedir. Ancak genetik, travma, hormonal faktörler, anormal kuvvete maruz kalma gibi durumların olası etyolojik faktörler arasında olduğu düşünülmektedir. Obwegesr ve Makek, 1986 yılında asimetri ve büyüme vektörüne dayanan bir KH sınıflandırma sistemi yayınlamıştır. Daha yakın zamanda, Wolford ve ark., KH'nin kondiler baş ve/veya boynun aşırı gelişmesine neden olan patolojik bir durum olduğu önerisine dayanan daha basit bir sınıflandırma sistemi önermişlerdir.

Kondiler hiperplazide genellikle çenenin kontralateral tarafa sapması ve buna bağlı gelişen fasiyal asimetri, prognatizm, çapraz kapanış gibi klinik durumlar görülebilmektedir. Kondiler hiperplazinin teşhisi klinik değerlendirme, fotoğraf kayıtları, dental model analizleri ve radyografik değerlendirmelerle yapılmaktadır. Panoramik radyografiler, lateral ve anteroposterior sefalometrik radyografiler, konik ışınlı bilgisayarlı tomografi (KIBT) ile kondildeki boyutsal ve morfolojik değişiklikler değerlendirilebilmektedir. Tedavi planlaması mandibular kondilin büyüme aktivitesinin durumuna göre değişiklik gösterir ve büyüme aktivitesinin değerlendirilmesinde düzlemsel sintigrafi, tek foton emisyonlu bilgisayarlı tomografi (SPECT) ve pozitron emisyon tomografisi (PET) gibi nükleer görüntüleme yöntemleri kullanılmaktadır.

Bu derlemede KH'nin tanımı, etyolojisi, sınıflandırılması, klinik, histolojik, radyografik özellikleri ve tedavi yönetimi hakkında bilgi verilmesi amaçlanmaktadır.

Anahtar Kelimeler: kondiler hiperplazi, mandibular kondil, mandibular kondiler hiperplazi

Kondiler hiperplazi, neoplazi olmadan mandibular kondilin aşırı büyümesine ve genişlemesine sebep olan durumları ifade eder. Bu durum, mandibula boyutunu ve morfolojisini olumsuz etkileyerek mandibular prognatizm gibi dentofasiyal deformitelerin gelişimine, çapraz kapanış gibi malokluzyona, fasiyal asimetriye ve ağrı, sınırlı ağız açıklığı gibi semptomlara sebep olabilir[1,2].

Epidemiyolojik olarak, kondiler hiperplazi genellikle genç kadınları etkileyen bir patolojidir[3]. Sağ ya da sol kondilin tutulum sıklığı açısından herhangi bir fark bulunmamaktadır. Genellikle 11-30 yaş arasındaki hastalarda görülmektedir[4,5]. Aynı zamanda literatürde KH'nin kendi kendini sınırlayan bir durum olduğu yani aktif büyümenin herhangi bir zamanında durabileceği bildirilmiştir[6].

KH'nin etyolojisi tam olarak belirlenememiştir. Gelişmekte olan kemik, proliferasyon ve farklılaşmaya neden olan, kemiğin konturunu, şeklini ve hacmini etkileyen; genetik, kimyasal, hormonal ve mekanik sinyallerden etkilenir. Bu uyaranlardan herhangi birinde oluşan değişiklik mandibular kondilin anormal gelişimine sebep olabilir[7]. KH'nin etyolojisinde de pre-kartilegenöz hücrelerinin rezidüel büyümesiyle ilişkili genetik, travma, hormonal faktörler, anormal kuvvete maruz kalma gibi durumların etken olduğu düşünülmektedir[8].

Submission Date: December 6, 2023
Acceptance Date: February 19, 2024
Corresponding author: Şeyma Kale
Address: Department of Oral and Maxillofacial Surgery, Kütahya Health Sciences University, Kütahya, Turkey
Phone: 0553 361 81 11
Email: Dt.berkanaltay@gmail.com

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Kondiler Hiperplazinin Klinik Değerlendirilmesi

KH, iyi bir anamnez, klinik muayene ile birlikte radyolojik ve histolojik değerlendirmeler ile teşhis edilebilmektedir[9]. KH'nin klinik değerlendirmesinde, muayene sırasında çene ucunun, mandibular dental orta hattın ve maksiller dental orta hattın fasiyal orta hatla ilişkisi değerlendirilmelidir. Ağız açma ve kapama sırasında dental interferanslar açısından okluzyon kontrol edilmelidir. Çünkü fonksiyonel deviasyon sebebiyle de asimetri mevcut olabilmektedir. Mandibular oklüzal düzlem eğiminin interpupiller düzlem ile olan ilişkisi bir Fox cetveli veya abeslang kullanılarak karşılaştırılmalıdır; açık bir kapanış ya da dentoalveolar kompanzasyon nedeniyle oklüzal kant mevcut olabilmektedir. Görsel muayenenin ardından sert ya da yumuşak doku asimetrisini ayırt etmek için yüzü palpe etmek gerekmektedir ve klik ya da krepitasyon varlığını tanımlamak için TME'yi palpe etmek gerekmektedir[10].

Kondiler Hiperplazinin Radyografik Değerlendirilmesi

Kondiler hiperplazinin teşhisi genellikle klinik değerlendirme, fotoğraf kayıtları, dental model analizleri ve radyografik analizlerle yapılmaktadır[9]. Panoramik radyografiler, lateral ve anteroposterior sefalometrik radyografiler, konik ışınlı bilgisayarlı tomografi (KICT) ile kondildeki boyutsal ve morfolojik değişiklikler değerlendirilebilmektedir. Kondil boyutunun ölçümü genellikle kondil başının en yüksek noktasından sigmoid çentik ya da mandibular lingulaya kadar yapılmaktadır. Farina ve ark'nın yaptığı bir çalışmada kondil boyutunu belirlemede stabil bir parametre olarak mandibular lingulanın kullanılmasının daha doğru olduğu sonucuna varılmıştır[11].

Kondiler Hiperplazi Sınıflandırılması

KH için çeşitli sınıflandırma sistemleri önerilmiştir. Obwegeser ve Makek 1986'da hemimandibular uzama (HU) ve hemimandibular hiperplazi (HH) olmak üzere iki farklı KH tipini tanımlayan bir sınıflandırma sistemi oluşturmuştur[12]. Bu sınıflamada hemimandibular uzama, belirgin bir vertikal uzama olmaksızın mandibulanın ve çene ucunun etkilenmemiş tarafa doğru yatay yer değiştirmesiyle oluşan bir deformite olarak tanımlanmıştır. Hemimandibular hiperplazi ise kondil, ramus ve korpus dahil olmak üzere mandibulanın üç boyutlu genişlemesini içeren, tek taraflı vertikal uzama deformitesi olarak tanımlanmıştır. Mandibular orta hat düzdür ve çene daha az deviyedir. Araştırmacılar hemimandibular uzama ile hemimandibular hiperplazi arasında karışık bir formun olabileceğini belirtmişlerdir[12].

Wolford ve ark. KH'nin çeşitli patolojik özelliklerini, klinik ve radyografik özelliklerini, tedavi protokollerini ele alan basit ama kapsamlı bir sınıflandırma yapmışlardır[2]. Bu sınıflandırma sisteminde KH'yi dört ana gruba ayırmışlardır. Sınıflandırma aynı zamanda KH tiplerinin görülme oranını da yansıtır; en sık görülen KH tip 1 A ve en az görülen KH tip 4'tür[13].

Wolford Sınıflaması Kondiler Hiperplazi Tip 1:

En sık görülen KH tipidir[2]. Genellikle adolesan dönemde ortaya çıkar ve patolojik süreç hormonal bir etiyolojiyi düşündüren pubertal büyüme fazında başlar. Hastaların %60'ı kadındır[9].

KH tip 1, mandibulada ağırlıklı olarak yatay bir vektörde aşırı büyüme ve sonuç olarak mandibular prognatizm oluşturan, normal kondiler büyüme mekanizmasının hızlandırılmış halidir[2]. Normal mandibular büyüme sürecinin tamamına yakını kızlarda genellikle 15 yaşlarında, erkeklerde 17-18 yaşlarında tamamlanmaktadır[14]. KH tip 1'de ise büyüme sıklıkla 20'li yaşların başları veya ortalarına kadar devam eder ancak kendi kendini sınırlayan bir büyüme anomalisidir. Mandibular büyüme hızındaki artış kondilde meydana gelir ancak kondil baş ve boynundaki uzama, mandibular gövdenin de uzamasına neden olur. Bu durum sınıf III iskelet ve oklüzal ilişki oluşmasına, mandibular kesici dişlerin linguale eğimli hale geldiği ve maksiller kesici dişler arasında diestemaların oluştuğu dental kompanzasyon mekanizmasının gelişmesine yol açar[9,15].

Hiperplazi bilateral (KH tip 1 A) veya unilateral (KH tip 1 B) olarak ortaya çıkabilmektedir[2]. Bilateral olguların yaklaşık üçte biri genetik ilişkili olabilir, ancak diğer üçte ikisi kendiliğinden oluşur[16]. Bilateral KH tipi olan KH tip 1 A'nın klinik değerlendirmesinde, her iki kondilde de simetrik bir büyüme söz konusu ise mandibular prognatizm, sınıf III maloklüzyon, anterior ve posterior çapraz kapanışlar, dental kompanzasyon (alt kesici dişlerin angulasyonunun azalması ve maksiller kesici dişlerin aşırı angulasyonu) görülmektedir. Bu hastalarda yüz şekli daha üçgen ve konik olup genellikle gonial açı geniştir. Masseter kas kütlesi normalden daha azdır. Simetrik büyüme varlığında daha az TME semptomu görülmektedir[2].

Bir tarafın diğerinden daha hızlı büyüdüğü asimetrik vakalarda ise mandibula daha yavaş büyüyen tarafa doğru deviye olmaktadır ve yüz asimetrisi gelişebilmektedir. Yavaş büyüyen tarafta anterior ve posterior çapraz kapanış; daha hızlı büyüyen

EurAsian Journal of Oral and Maxillofacial Surgery
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tarafta daha şiddetli sınıf III oklüzyon görülmektedir. TME'de daha yavaş büyüyen tarafta ve bazen daha hızlı büyüyen tarafta yer değiştirmiş eklem diski, TME semptomları (klik sesi, TME ağrısı, baş ağrıları, çiğneme bozukluğu veya kulak semptomları) görülmektedir[2].

KH tip 1 A vakalarının lateral sefalometrik ve tomografik analizlerinde sınıf III iskeletsel ve okluzal ilişki görülür. Ancak yüksek oklüzal düzlem açısına sahip hastalarda iskeletsel ilişki sınıf I'e daha yakın olabilmektedir. Kondil başı ve boynu uzundur ancak kondilin üst kısmı pürüzsüz, normal görünen bir morfolojiye sahiptir. Koronal görünümde ise normalden daha yuvarlak görülebilmektedir. Mandibular korpus uzun olup gonial açı daha geniş olabilmektedir. Posterior mandibular korpusun vertikal yüksekliği daha az, simfiz ve alveolün anteroposterior (AP) kalınlığı daha dar olabilmektedir. Mandibular ramusun mediolateral genişliği ve AP boyutu normale göre daha dar olabilmektedir[2]. Manyetik rezonans görüntülemede (MRG), eklem diskleri genellikle incedir ve tanımlanması zor olabilir. Nadiren artiküler disklerde yer değiştirme görülebilmektedir. Vertikal kondiler büyüme hızında bir artış olduğunda disk posteriora yer değiştirebilmektedir. Asimetrik KH tip 1A vakalarında disk dislokasyonu tek taraflı (yavaş büyüyen tarafta daha fazla risk) veya iki taraflı olarak ortaya çıkabilmektedir[2].

Tek taraflı KH tipi olan KH tip 1 B'nin klinik değerlendirmesinde genellikle yatay yönde bir büyüme gözlenir. Sol ve sağda yüz yüksekliği genellikle eşittir ancak ipsilateral taraf bazen vertikal olarak daha uzun olabilmektedir. Mandibula prognatiktir ve kontralateral tarafa deviye olur. Mandibular dental orta hat ve çene-yüz orta hattı da kontralaterale deviye olur. Kontralateral tarafta genellikle sınıf I oklüzyon görülürken ipsilateral tarafta sınıf III oklüzyon görülmektedir. Anteriorda ve kontralateral tarafta çapraz kapanış görülmektedir. Özellikle kontralateral tarafta eklem diskinin yer değiştirmesine bağlı tipik TME semptomları görülebilmektedir[2].

KH tip 1B vakalarının radyografik görüntülerinde mandibular prognatizm ve asimetri görülür. İlgili taraftaki kondil başı ve boynu kontralateral tarafa göre daha uzundur. Mandibulanın ipsilateral gövdesi daha eğri, kontralateral taraf daha düz olabilir ve bu da mandibulanın eksenel düzleminde önemli bir asimetri yaratır. MRG'de, kontralateral tarafta disk dislokasyonu görülebilmektedir. İpsilateral eklem diski genellikle normal bir diskten daha incedir, bu da bazen diskin MRG'de tanımlanmasını zorlaştırır[2].

KH tip 1'in tedavisi büyümenin aktif olup olmadığına bağlıdır. KH tip 1 kendini sınırlayan bir durum olduğundan, 20'li yaşların ortalarındaki veya daha büyük hastalarda dentofasiyal deformiteyi ve maloklüzyonu düzeltmek için genellikle rutin ortognatik cerrahi prosedürler uygulanabilir. Ancak eklem diskleri yer değiştirmiş durumdaysa, disklerin yeniden konumlandırılması gerekebilir[2].

Hasta 20'li yaşların başındaysa, büyüme süreci aktif ve ilerleyici olabilir. Aktif büyüme varsa ve sadece ortognatik cerrahi yapılırsa nüks söz konusu olacaktır[9,15]. Büyüme aktif ise öngörülebilir iki tedavi seçeneği vardır.

Birinci tedavi seçeneğinde aktif KH tip 1A için cerrahi protokol; mandibulanın AP yönde büyümesini engelleyecek şekilde özellikle medial ve lateral kutupları içeren her iki kondil başının üst 4-5 mm'lik kısmının dahil olduğu bir yüksek kondilektomidir. Mitek ankoru tekniği kullanılarak eklem disklerinin yeniden konumlandırılması sağlanabilir. Endikeyse bilateral mandibular ramus osteotomileri ve maksiller osteotomiler ile uygun ortognatik cerrahi prosedürlerin uygulanması ve ek yardımcı prosedürler (genioplasti, rinoplasti vb.) uygulanabilir. Bu işlemler tek bir ameliyatta yapılabileceği gibi iki veya daha fazla ameliyatta da yapılabilir ancak önce TME ameliyatı yapılmasının gerektiği belirtilmiştir[2].

İkinci tedavi seçeneğinde büyüme tamamlanana kadar cerrahi ertelenmekte ve ardından sadece ortognatik cerrahi yapılmaktadır. Bununla birlikte cerrahi tedavi ne kadar ertelenirse yüz deformitesi, asimetri ve dental kompenzasyon mekanizmaları sonuçta; oklüzyon, çiğneme, konuşma ve psikososyal gelişim de o kadar olumsuz etkilenmektedir. Aynı zamanda bu durum optimal fonksiyonel ve estetik sonuç elde etmedeki zorlukları da arttırabilmektedir[9,15].

Aktif KH tip 1A'nın tedavisine yönelik Wolford cerrahi protokolünün, anormal büyümenin durdurulması, aynı ameliyatta ortognatik cerrahinin tamamlanması, uzun süreli stabil fonksiyonel ve estetik sonuçlar sağlaması nedeniyle oldukça öngörülebilir bir tedavi şekli olduğu bildirilmiştir[9,15]. Yazarlar çift çene cerrahisi gerektiren vakalarda KH tip 1A'nın cerrahi tedavisinin normal maksiller ve mandibular büyümenin tamamlanmaya yakın olduğu kızlarda en az 14 yaşına ve erkeklerde 16 yaşına kadar ertelenmesi gerektiğini bildirmişlerdir[2]. Sadece yüksek kondilektomi ve mandibular osteotomilerin yapılacağı vakalarda ise (maksiller osteotomi yok), maksilla AP ve dikey yönlerde büyümeye devam

EurAsian Journal of Oral and Maxillofacial Surgery
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edebileceğinden, cerrahinin kızlarda 15 yaşına kadar ve erkeklede ise 17-18 yaşına kadar ertelenmesi gerektiği bildirilmiştir[2].

KH tip 1B'de yaygın semptom yüz asimetrileri olmakla birlikte tedavi seçenekleri KH tip 1A ile benzerdir. Aktif büyüme devam ediyorsa, tedavi için iki seçenek bulunmaktadır[2].

Birinci seçenekte; tek taraflı yüksek kondilektomi yapılması, endikeyse kontralateral diskin yeniden konumlandırılması, fonksiyonel ve estetik sonuçları optimize etmek için ortognatik cerrahi prosedürler ve diğer ikincil prosedürler (genioplasti, rinoplasti vb.) yer alır. Bu protokol, ipsilateral mandibular büyümeyi başarılı bir şekilde durdurmakta, normal çene fonksiyonuyla beraber iyi estetik sonuçlar sağlamaktadır[9,15]. KH tip 1B olgularında cerrahi kızlarda 15, erkeklerde 17-18 yaşlarına kadar ertelenmelidir. Eğer ipsilateral yüksek kondilektomi normal çene büyümesi devam ederken yapılırsa, ameliyat edilmemiş kontralateral kondilin normal büyümeye devam etmesi ve normal büyüme durana kadar mandibulayı ipsilateral tarafa kaydırması riski vardır. KH tip 1B'de kontralateral TME diski yaygın olarak yer değiştirmiştir. Bu nedenle, Mitek ankor tekniği ile diskin yeniden konumlandırılması yüksek kondilektomi olmaksızın endike olabilir. Bununla birlikte, aktif büyüme sırasında daha genç yaşta cerrahi endike ise, mandibulanın büyümemesi ve simetrik kalması için karşı tarafa da yüksek kondilektomi yapılabilmektedir[2].

İkinci tedavi seçeneği ise cerrahinin, büyüme tamamlanana kadar ertelenmesi ve daha sonra sadece ortognatik cerrahi yapılmasıdır. Diskleri yeniden konumlandırmak, eklemleri stabilize etmek ve ağrı faktörlerini ortadan kaldırmak için ortognatik cerrahi ile birlikte TME cerrahisi endike olabilmektedir. Ancak anormal büyümenin ilerlemesine ne kadar uzun süre izin verilirse, mandibular asimetri ve ipsilateral aşırı yumuşak doku gelişimi o kadar fazla olacaktır[2].

Wolford Sınıflaması Kondiler Hiperplazi Tip 2:

KH tip 2, büyüme ile ilişkili olarak kendi kendini sınırlamayan, bir osteokondromun neden olduğu tek taraflı mandibular kondil büyümesidir. Osteokondromlar, tüm benign tümörlerin yaklaşık %35 ile %50'sini, tüm primer kemik tümörlerinin %8 ile %15'ini oluşturur ve mandibular kondilin en yaygın görülen tümörüdür[2].

KH tip 2'de kondiler patolojinin doğrulanması için histolojik değerlendirme gerekir. Bu patolojinin büyüme hızı vakadan vakaya değişiklik gösterir. Vakaların %68'i ikinci on yılda başlasa da her yaşta gelişebilir ve ağırlıklı olarak kadın hastalarda (%76) görülmektedir. Mandibulanın vertikal yönde aşırı büyümesi söz konusudur. KH tip 2 A'da büyüme vektörü vertikal yönde gelişim gösterir ve kondil başı ile boynunun genişlemesi ile karakterizedir. KH tip 2 B'de kondilde horizontal yönde uzanan ekzofitik tümör büyümeleri bulunur[2].

İpsilateral tarafta mandibulanın vertikal yönde uzaması ve kontralateral tarafa deviasyonu ile karakterizedir. İpsilateral mandibular kondil, kondil boynu, ramus, korpus ve dentoalveolü içeren tek taraflı yükseklik artışı görülmektedir. İpsilateral tarafta çiğneme kaslarında uzama ve yüzün ipsilateral tarafında artan yumuşak doku hacmi görülmektedir. Kontralateral tarafa doğru deviasyon ile birlikte vertikal ve transvers yönde çene asimetrisi oluşabilmektedir. İpsilateral maksiller dentoalveolde kompansatuar aşağı doğru büyüme gözlenmektedir[9]. Özellikle hızlı büyüyen vakalarda ipsilateral tarafta lateral açık kapanış görülmektedir. İpsilateral posterior dişlerde labiale; kontralateral posterior dişlerde linguale devrilme ve oklüzal düzlemde enine bir eğim söz konusudur. Genellikle kontralateral TME semptomatiktir[2].

KH tip 2 vakalarının radyolojik görüntülerinde uzun ve geniş deforme kondil (KH tip 2 A), ya da genellikle kondil dışında ekzofitik tümör uzantıları (KH tip 2B) olduğu görülmektedir. İpsilateral mandibular kondil, kondil boynu, ramus, korpus, simfiz ve dentoalveolde vertikal yükseklik artışı ve kondil boynunda AP ve mediolateral olarak boyut artışı görülmektedir. Oklüzal düzlemde enine eğim, yüz asimetrisi görülmekte, ipsilateral mandibular ramusun arka sınırı normalden daha dik olabilmektedir. Koronoid proçes genellikle normal boyuttadır ve temporal kasın uzaması ile zigomanın altına yer değiştirebilmektedir[2].

MRG'de kontralateral tarafta deplase disk ve artritik değişiklikler görülebilmektedir. KH tip 2'de ekzofitik büyümeler nispeten büyük olduğunda, çenelerin ve yüzün ipsilateral vertikal yüksekliğinin daha da artmasına neden olarak kondilin aşağı ve fossa dışına doğru yer değiştirmesine neden olabilmektedir[2].

KH tip 2'nin tedavisi için iki temel tedavi yaklaşımı vardır. Bu patoloji genellikle ilerleyici olduğundan, her iki seçenek de tümörü çıkarmak için bir kondilektomi gerektirmektedir[2].

EurAsian Journal of Oral and Maxillofacial Surgery
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Wolford'un birinci cerrahi protokolünde ipsilateral taraftaki kondilin kondil tabanından çıkarıldığı ve kondil boynunun korunduğu bir düşük kondilektomi, kondil boynunun yeniden şekillendirilmesi, eklem diskinin kondil boynunun üst kısmında yeniden konumlandırılması ve stabilizasyonu, kontralateral tarafta diskte yer değiştirme var ise diskin yeniden konumlandırılması, ilişkili maksiller ve mandibular deformiteleri düzeltmek için ortognatik cerrahi yapılması yer almaktadır. Bu tedavi yaklaşımı, tümörün çıkarılmasına izin vermekte ve kondil boynunu yeni kondil olarak kullanılmasını sağlamaktadır. Fonksiyon, estetik ve ilişkili ağrının ortadan kaldırılması amacıyla ipsilateral ve kontralateral eklem diski (eğer disk yer değiştirmişse) yeniden konumlandırma ve stabilizasyon gerektirmektedir[17]. Disk tedavi edilmez durumda ise ipsilateral veya kontralateral TME'yi yeniden yapılandırmak için total eklem protezi tercih edilebilmektedir[2].

İkinci tedavi seçeneği ise ortogantik cerrahi yapılmaksızın ipsilateral tarafta kısmi ya da tam kondilektomi yapmaktır. Tam kondilektomi ile tüm kondil ve kondil boynunun çıkarıldığı durumlarda, kondil rekonstrüksiyon teknikleri (total eklem protezi, kosta grefti, sternoklaviküler greft, serbest kemik grefti, veya pediküllü kemik grefti) kullanılmaktadır[2].

KH tip 2 normal büyüme-gelişim aşamasında teşhis edilirse cerrahi tedavi, çene büyümesi nispeten tamamlandıktan sonra; mümkünse kızlar için 15 yaşına, erkekler için 17-18 yaşına kadar ertelenmelidir. Bununla birlikte, deformitenin ciddiyeti, daha genç yaşta ameliyat yapılmasını gerektirebilmektedir. Düşük kondilektomi normal çene büyümesi devam ederken yapılırsa, kontralateral taraftaki kondilin normal büyümeye devam etmesi ve büyüme durana kadar mandibulayı ipsilateral tarafa kaydırması riski bulunmaktadır. Bununla birlikte, daha genç yaşta cerrahi endikasyonu varsa, daha fazla büyüme olmayacak ve mandibula simetrik kalacak şekilde karşı tarafa yüksek kondilektomi yapılabilmektedir. Diğer bir seçenek ise tek taraflı kondilektomi yapmak ve büyümenin durmasından sonra ikinci aşama olarak ortognatik cerrahi planlamak olabilmektedir[2].

Wolford Sınıflaması Kondiler Hiperplazi Tip 3:

Osteoma, kondroblastoma, osteoid osteoma, osteoblastoma, anevrizmal kemik kisti ve santral dev hücreli granülom gibi mandibular kondilden kaynaklanan nadir benign tümörleri kapsar[2].

Wolford Sınıflaması Kondiler Hiperplazi Tip 4:

Kondrosarkom, osteosarkom ve metastatik karsinom gibi kondilden kaynaklanan malign tümörleri kapsar[18].

Kondiler Hiperplazinin Ayırıcı Tanısı

Wolford ve ark. 2014 yılında kondiler hiperplazi için basit ama kapsamlı bir sınıflandırma sistemi ortaya koymuşlardır[2]. Bu sınıflandırma sisteminde KH dört tipe ayrılmıştır. Her tipin görüldüğü yaşlar, klinik, radyolojik ve histolojik özellikleri farklı olup ayırıcı tanılarının yapılması gerekmektedir.

KH tip 1 ile maksiller hipoplazi arasında ayrım yapılabilmelidir. Maksiller hipoplazi normal olarak büyüyen bir mandibula varlığında sınıf III oklüzal ve iskeletsel ilişkisi ile sonuçlanabilir ve bu pubertal büyüme fazından yıllar önce belirgindir. Bununla birlikte KH tip 1 genellikle pubertal büyüme sırasında başlayana kadar belirgin değildir[2].

Fasiyal asimetri iskelet, diş, yumuşak doku veya duruş faktörlerinin sonucunda gelişebilmektedir ve fasiyal asimetriye neden durumların tek taraflı KH'den ayırıcı tanısının yapılması gerekmektedir. Pubertal büyüme atağı sırasında ortaya çıkan alt yüzün ilerleyici asimetrisi kondiler hiperplazi tanısını destekler. Doğumdan beri var olan asimetri genellikle başka bir patolojiyi düşündürür ve hastaya ait fotoğraflar tanı koymada yardımcı olabilir[10]. Bununla birlikte fasiyal asimetri olgularının önemli bir kısmı da kondiler hiperplazi olgusudur[19].

Kondiler Hiperplazide Büyüme Aktivitesinin Değerlendirilmesi

Kondiler hiperplazinin tedavi planlamasında değerlendirilen en önemli parametre kondiler büyüme aktivitesinin durumudur. Büyüme aktivitesi klinik yöntemler ya da nükleer görüntüleme yöntemleri kullanılarak değerlendirilebilmektedir.

Büyüme hızı genellikle 6-12 ay aralıklarla yapılan klinik değerlendirme, dental model analizleri ve radyografik analizler ile fonksiyon, estetik, iskeletsel ve oklüzal değişikliklerin değerlendirilmesi ile tahmin edilebilmektedir[9,15]. Pubertal büyüme sırasında mandibulanın normal yıllık büyüme hızı lateral sefalometrik radyografide kondilyon ve B noktası (mandibulanın anterior yüzeyindeki konkavitenin en derin noktası) arasındaki mesafe ölçülerek değerlendirilebilir[14]. Özellikle tek taraflı KH vakalarında frontal sefalometrik radyografiler tanı koymada yardımcı olabilmektedir. TME, mandibular ramus, korpus ve posterior dişleri görüntüleyen lateral sefalometrik tomografiler ile her iki kondilin büyüme

EurAsian Journal of Oral and Maxillofacial Surgery
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miktarı analiz edilebilmektedir[2].

Mandibular kondilin büyüme aktivitesinin değerlendirilmesinde düzlemsel sintigrafi, tek foton emisyonlu bilgisayarlı tomografi (SPECT) ve pozitron emisyon tomografisi (PET) gibi nükleer görüntüleme yöntemleri de kullanılmaktadır[20].

Radyofarmasötiklerin vücut içindeki dağılımının gama kamera ile görüntülenmesine sintigrafi adı verilmektedir. Düzlemsel kemik sintigrafisi, kemiğin kan akımı, metabolizması ve turn overı gibi durumları gösteren bir görüntüleme yöntemidir[21]. Radyonüklidle işaretlenmiş fosfatların intravenöz enjeksiyonu ve bu fosfatların kemik hücreleri tarafından metabolize edilip yeni kemiğin oluştuğu alanlarda birikmesi ve bunun görüntülenmesine dayalı bir yöntemdir. KH'de anormal kondiler büyüme merkezine sahip tarafı belirlemek için bir düzlemsel kemik sintigrafisi yapılabilmektedir[22]. Düzlemsel kemik sintigrafisi spesifik değildir; enflamatuar, travmatik, neoplastik ve normal büyüme süreci gibi kemik metabolizmasında artışın olduğu her durumda radyonüklid alımında artış görülebilmektedir[23]. Aynı zamanda düzlemsel sintigrafi, üç boyutlu görüntü oluşturan SPECT ve PET'in aksine iki boyutlu bir görüntü verir[24].

SPECT, sintigrafinin bir varyasyonudur ve bir radyofarmasötik madde kullanılarak değerlendirilen organın kan akışı, metabolik aktivitesi gibi metabolik tepkisini yansıtan bir fonksiyonel görüntüleme yöntemidir[25–27]. SPECT incelemelerinde, radyoaktif madde ile etiketlenmiş ve osteoblastik aktiviteye afinitesi olan bir bileşik intravenöz olarak enjekte edilir ve artan kemik döngüsü alanları üç boyutlu görüntüleme sağlayan döner bir gama kamera ile tespit edilir. Bu radyoaktif madde kemik dokusundaki hidroksiapatit kristalleri ve kalsiyum tarafından emilir ve alımının yoğunluğu osteoblastik aktivite ile orantılıdır[28]. SPECT, basit düzlemsel sintigrafiye göre duyarlı ve özgül bir tekniktir. Saridin ve ark. tarafından yapılan bir meta-analizde SPECT tekniğinin düzlemsel sintigrafiye göre tek taraflı KH'yi tespit etmede önemli ölçüde daha yüksek hassasiyete sahip olduğu bildirilmiştir[26]. Düzlemsel kemik taramalarından elde edilen çalışmalar, anteroposterior görünümde kondillerin petroz kemik, mastoid çıkıntı ve lateral görünümde birbiriyle süperpoze olması nedeniyle bazı sınırlamalara sahiptir. SPECT, iki kondili oldukça doğru bir şekilde izole edebildiği için düzlemsel taramadan üstündür[29].

SPECT taramasında etkilenen ve kontralateral kondiller arasındaki aktivite farkı %10'dan büyükse kondiller asimetrik olarak kabul edilmektedir[23,26,30]. Aynı zamanda kondillerde %55'in üzerinde radyonüklid alımının KH'nin bir göstergesi olduğu düşünülmektedir[23]. Ancak kemik sintigrafisinde olduğu gibi SPECT taramasında da kondiler hiperplazi ile inflamatuar, enfektif, neoplastik durumlar arasında ayrım yapılamaz ve bu nedenle sonuçlar klinik bulgular ile desteklenmelidir[31].

PET dokuların metabolik fonksiyonları hakkında bilgi veren moleküler görüntüleme yöntemidir. SPECT ve düzlemsal sintigrafide radyonüklid olarak teknesyum-99m etiketli metilen difosfonat (99mTc-MDP) kullanırken, PET'de (^{18}F)-floroid kullanır. PET, SPECT'den daha iyi uzamsal çözünürlüğe sahip görüntü sağlamaktadır. 99mTc-MDP ile karşılaştırıldığında, (^{18}F)- floroid üstün biyolojik özellikler sunar. (^{18}F)- floroid'in proteine bağlı fraksiyonu daha düşüktür ve kandan temizlenmesi daha hızlıdır. Sadece inorganik kemik matriksine adsorbe edilen 99mTc-MDP'nin aksine (^{18}F)- floroid iyonları sadece kemik oluşumu sırasında kemik dokusunun mineral kristaline kimyasal olarak bağlanır ve bu nedenle daha seçici olarak osteogenez alanları izlenir[32]. 2015 EANM (Avrupa Nükleer Tıp Birliği) yönergesi, KH'nin değerlendirmesinde PET/CT kullanılmasını önermektedir[33].

TARTIŞMA

KH, mandibular kondil hücrelerinin hiperaktivitesi veya bir tümörün neden olduğu TME ile ilişkili büyüme anormalliğidir[34–36]. KH, nadir görülen bir durumdur ve sıklıkla genç kadınlarda görüldüğü bildirilmiştir[3]. Ancak bazı çalışmalar her iki cinsiyette ve tüm etnik gruplarda benzer insidans gösterdiğini bildirmiştir[22,37].

Obwegeser ve Makek KH'yi HH ve HU olarak sınıflamışlardır[12]. Wolford ve ark. da KH sınıflaması yapmışlar ve KH için dört ayrı tip belirtmişlerdir[2]. KH tip 1 yatay yönlü kondiler büyümeyi ifade etmektedir ve bu tip HU'ya karşılık gelmektedir. KH tip 2'de osteokondrom nedeniyle kondil başı-boynu, ramus ve korpusta tek taraflı bir genişleme gözlenmektedir ve bu tip HH'ye karşılık gelmektedir[12,38]. Obwegeser ve Makek HH ve HU'nun özelliklerini taşıyan karışık bir formun da olabileceğini belirtmişlerdir ve bununla ilgili olarak yakın zamanda tek taraflı KH vakalarında büyüme yönünü (vertikal ya da horizontal) araştıran bir çalışmada vakaların çoğunda diyagonal bir büyüme vektörünün etkili olduğu bulunmuştur[12,39].

Kapsamlı anamnez ve klinik değerlendirme, KH'nin tanı ve tedavi planlamasında kilit unsurlardır. Pubertede ortaya çıkan ilerleyici asimetrik büyüme, ilk tanıya yardımcı olmaktadır

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ve doğumdan beri mevcut olan asimetri genellikle başka bir patoloji ile ilişkilidir[40].

Konvansiyonel görüntüleme tekniklerinin KH için ilk tanıda kullanılabileceği ancak kesin tanı için güvenilmez olduğu bildirilmiştir[41]. Bununla birlikte kondiler hiperaktiviteyi değerlendirmek için bir yöntem olarak iki ardışık lateral sefalogramın (6 ila 12 aylık aralıklarla) kullanılması önerilmiştir[15]. Bilgisayarlı tomografi cerrahi planlamada faydalıdır ve kondiler hiperaktivitede kondiler büyüme ile osteokondroma arasında ayrım yapmada rol oynamaktadır[42].

KH tanısında en önemli belirleyici kondiler aktivitenin değerlendirilmesidir[43]. Düzlemsel sintigrafi ile kondiler büyüme merkezlerinin aktif olup olmadığını belirlemek mümkün hale gelmiştir. Düzlemsel sintigrafinin kondiler büyüme aktivitesi ile aktif hiperplaziyi ayırt etmedeki tutarsızlığı ve özgüllüğünün olmaması nedeniyle SPECT, KH tanısında önemli bir rol üstlenmiştir[30]. Ancak SPECT için de bazı sınırlamalar bulunmaktadır. SPECT kondiler hiperaktivite ile enfektif, inflamatuar koşullar arasında ayrım yapamaz ve bulguları bazen daha genç hastalarda veya yavaş ilerleyen hiperplazide sonuçsuz olabilmektedir[31]. Bu sebeple PET, KH teşhisinde umut verici bir yöntem olarak görülmektedir[20].

KH ile hemifasiyal mikrozomi, çene travması ve benign ya da malign tümörler gibi diğer yaygın yüz asimetrisi nedenlerinin ayırıcı tanısı yapılmalıdır. Bu nedenle klinik tablonun radyolojik ve histolojik bulgularla ilişkilendirilmesi önem arz etmektedir[38].

KH için en yaygın bildirilen tedavi seçenekleri; tek tedavi olarak ortognatik cerrahi, mandibular kondilin rezeksiyonundan oluşan cerrahi tedavi (yüksek veya düşük kondilektomiler) veya her ikisinin kombinasyonundan oluşmaktadır. Aktif hastalık, kondiler redüksiyon ile; aktif olmayan hastalık ise geleneksel ortognatik cerrahi prensiplerine göre tedavi edilmektedir[10]. Çalışmaların çoğu, kondilin hiperaktivitesinden dolayı erken müdahaleyi önermektedir. Bu şekilde minimum müdahale ile daha iyi estetik ve fonksiyonel sonuçlar alınabileceği bildirilmiştir[44]. Genel olarak, literatürde KH'li hastalar için en sık uygulanan tedavi seçeneklerinin Wolford ve ark.'nın da önerdiği şekilde, aynı seansta veya daha sonraki zamanlarda gerçekleştirilen ortognatik cerrahi ile birlikte yüksek kondilektomi ve bir değişken olarak artiküler disk replasmanı olduğu görülmektedir[15,19,45]. Tek başına yüksek kondilektominin uygulandığı vakalarda her zaman fasiyal ve dental simetri sağlanamadığı için ikincil ortognatik cerrahi ihtiyacı oluşmaktadır. Bu sebeple Farina ve ark. mandibular yüksekliğin ve asimetrinin düzeltilmesi amacıyla kondilin aktif kısmının çıkarılmasına ek olarak, etkilenen taraftaki kemiğin bir kısmının etkilenmemiş tarafa uyacak şekilde rezeke edilmesini içeren düşük kondilektomi tekniğini önermişlerdi[46]. Bununla ilgili olarak 2019'da yapılan bir sistematik derlemede düşük ve yüksek kondilektomilerin etkinliği ikincil ortognatik cerrahi ihtiyacı açısından değerlendirilmiş ve düşük kondilektomininin daha etkin olduğu sonucuna varılmıştır. Büyüme aktivitesi artan ve belirgin asimetrisi olan hastalarda yüksek kondilektomi yerine düşük kondilektomi tercih edilmesi gerektiği belirtilmiştir[47].

Kondilektomilerin zamanlaması açısından da literatürde bir fikir birliği bulunmamaktadır[2,12,40]. Wolford ve ark., cerrahinin ortalama kızlarda 14 yaşında ve erkeklerde 16 yaşında yapılabileceğini belirterek erken cerrahi müdahale önermişlerdir. Yazarlar, aktif hastalığı bulunan vakalarda; sadece ortognatik cerrahi uygulandığında ikinci bir cerrahi müdahaleye ihtiyaç duyulduğunu belirtirken, ortognatik cerrahi ve yüksek kondilektomi yapılan vakalarda nüks görülmediğini belirtmişlerdir[9,15]. Ayrıca, Abotaleb ve ark. tanı doğrulandıktan sonra erken yüksek kondilektomi yapılması gerektiğini belirtmişledir[48]. Bununla birlikte, bazı çalışmalarda kondilektominin 18 yaşından büyük hastalar için altın standart olduğu bildirilmiştir[49]. Yetişkinlerde yapılan kondilektomiler sonrasında nüks riskinin daha düşük olduğu ve daha istikrarlı sonuçlar elde edildiğini bildiren çalışmalar da mevcuttur[8]. Tedavi yönetimi konusunda bir fikir birliği bulunmamaktadır ve KH'nin tedavisinde her vakanın klinik, radyografik özellikleri, hastanın talepleri göz önünde bulundurularak bireysel tedavi planlaması yapılması gerektiği düşünülmektedir.

SONUÇ

KH'nin epidemiyolojisi ve etiyolojisi hala tam olarak anlaşılamamıştır[49]. Bu patoloji kondil başında meydana gelmektedir ve sonuçta klinik olarak fasiyal asimetri, oklüzyonda bozukluk, ağrı gibi semptomlar oluşmaktadır[8]. KH ile ilgili büyüme vektörlerine ve mandibular kondillerin tek taraflı veya iki taraflı tutulumuna dayanan farklı sınıflandırma sistemleri önerilmiştir. Radyografik olarak, kondil başının şekli konik, küresel, uzamış lobüle, genişlemiş veya düzensiz bir görüntüde olabilmektedir[8]. Büyümenin aktif olup olmadığı düzlemsel sintigrafi, SPECT, PET gibi gelişmiş görüntüleme yöntemleri ile değerlendirilebilmektedir[10].

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KH'nin tedavi yönetimi karmaşıktır ve hasta yaşı, asimetrinin şiddeti, maloklüzyon ve kondiler büyüme aktivitesi gibi birçok faktöre bağlıdır. KH için en yaygın bildirilen tedavi seçenekleri ortognatik cerrahi, kondilektomiler ve her ikisinin kombinasyonudur[50].

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CASE REPORT

An Implant-Supported Obturator for Hemi-maxillectomy Patient: A Case Report

Gökhan Gürses[1], Fulya İdil Ömeroğlu Akkoç[1], Necla Demir[2], Aslı Ataseven[1], Ahmet Aktı[1], Abdullah Kalaycı[1]

[1]Selcuk Unıversity Faculty of Dentistry Department of Oral and Maxillofacial Surgery, Konya
[2]Selcuk Unıversity Faculty of Dentistry Department of Prosthodontics, Konya

ABSTRACT

Objective: Adenoid cystic carcinoma is 1% among all head and neck malignancies, 10% among all salivary gland malignancies, the most common in the 6-7th decades. It is seen in women more frequently and often in the head and neck parts. Nowadays, the main treatment of ACC is surgery. This case report presents the rehabilitation of a patient with an implant-supported obturator following maxillary hemi-section due to adenoid cystic carcinoma (ACC).

Case: The 67-year-old female patient applied to our clinic for prosthetic rehabilitation. The patient had previously undergone right hemi-maxillectomy for adenoid cystic carcinoma in another center. Implant supported obturator treatment was planned for the patient. A total of six implants were placed, four in the maxilla and two in the mandible. After the implant osseointegration was completed, an obturator which was supported by the dental implants was applied. The patient has been followed up for four year. During this period, implants failed many times. New implants were placed instead of them. The obturator has not been completely renewed, it has been adjusted twice by making changes in it. The patient still uses her implant supported obturator even after four years.

Conclusion: Implant supported obturators are a good option for the treatment of resective surgeries of the jaws.. They rehabilitate the patient's lost functions such as speech and chewing well.

Keywords: Adenoid cystic carcinoma, hemi-maxillectomy, obturator

INTRODUCTION

Adenoid cystic carcinoma (ACC) is a malignant tumor originating from the salivary glands in the head and neck region. This type of tumor was first described as a benign lesion by Billoroth in 1856[1]. Approximately 10-15% of salivary gland tumors are ACCs[2]. ACC is most common in the minor salivary glands[3]. It is more common in women than in men and is seen in the 5th decade[2]. ACC is rare in the head and neck region and is most commonly seen on the hard plate[1].

The effective treatment method in ACC cases is radical surgery. There were reports which indicate that only radiotherapy can provide successful treatment[4]. However, it is reported that the application of radiotherapy after radical surgery eliminates local and regional recurrence and increases the 10-year survival rate of patients to 57%[5]. After the surgery, the relationship between the mouth and nose is generally impaired in patients. Hard and soft palate loss occurs due to radical surgery. Apart from oncological conditions, these losses can also be due to congenital cleft palate or trauma.

Maxillary defects caused by tumor resection cause high levels of psychological and physical trauma for patients. These patients have problems including aesthetics, speech, breathing, swallowing, and air-liquid passage.

Submission Date: September 8, 2023
Acceptance Date: February 8, 2024
Corresponding author: Fulya İdil Ömeroğlu Akkoç
Address: Güzeloba Mah.2272. Sk. no:80/1 Muratpaşa/Antalya
Phone: 0539 278 18 61
Email: fulyaidil1@gmail.com

EurAsian Journal of Oral and Maxillofacial Surgery
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The size of the area and anatomical difficulties complicate the treatment both surgically and prosthetically. In defect repair, fibula, ilium, soft tissue, free tissue, free vascularized flaps, and similar grafts can be used for grafting[6]. Many patients do not want to undergo surgical reconstruction due to local donor site morbidity, anatomical complexity, systemic radiation therapy, and the possibility of tumor recurrence[7]. Implant-supported or conventional obturator prosthesis treatments are among the frequently used treatment options[7]. Implant-supported obturators also have advantages over conventional obturators, such as additional support and aid in retention[8]. The overall survival rate of implants supporting maxillofacial prostheses is as high as 96.1%[8].

CASE REPORT

A 64-year-old female patient who applied to our clinic in 2019 had previously undergone hemi-maxillectomy due to adenoid cystic carcinoma in another center (Figure 1). The patient applied to our clinic for rehabilitation treatment. Due to limited residual ridge and insufficient bone support, a conventional obturator full denture was thought not to provide adequate function and comfort. Thus, implant treatment was decided. Our clinic placed four implants under local anesthesia in regions 11, 12, 21, and 23 (3.3 mm diameter, 10 mm length - Straumann), which is shown in Figure 2. After four months, the implant platforms were exposed, and the healing caps were placed under local anesthesia. Two implants placed in regions 11 and 12 were close to each other, and the implant placed in number 11 was left in the bone without loading. The prosthetic procedure started approximately two weeks after the abutment connection. Then, the patient's prosthesis treatment was completed with an implant-supported obturator (Figure 3-4).

Figure 1. Orthopanthomogram before implant placements

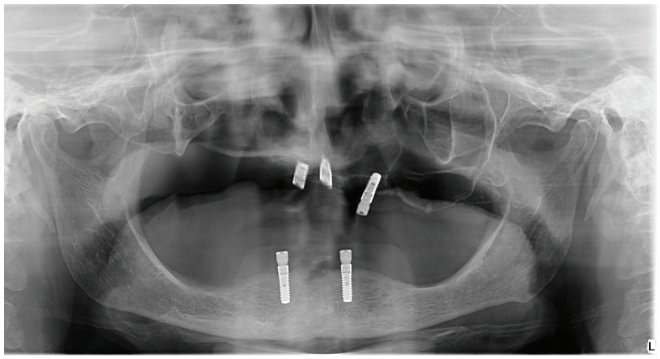

Figure 2. Orthopanthomogram after implant placements

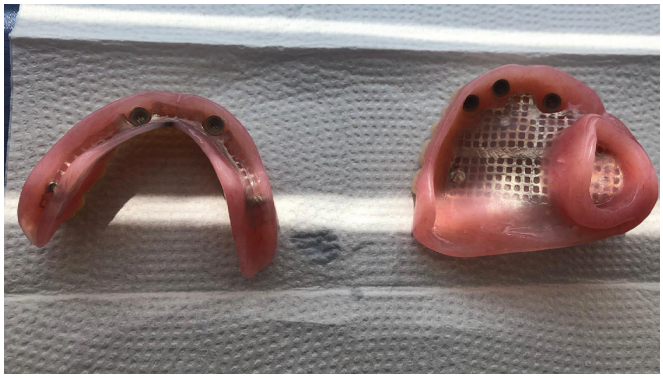

Figure 3. External view of the obturator

Figure 4. Intra-oral view of the obturator

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In the 1st year follow-up of the patient, the implant placed at number 21 failed. The implant was placed again in the same place, and the patient continued to use the prosthesis. In the 2nd year follow-up of the patient, the implant was placed at number 12, which is close to the defect failure. Before the new implant was made, the top of the implant left in the bone was opened and used, and the patient's obturator was adjusted by making changes. The failure was reencountered in the 3rd year follow-up of the patient. The implant placed in number 11 has failed. Instead, a new implant was placed at number 12. Again, the obturator was adjusted on a total of 3 implants. At the end of the 3rd year, the only remaining implant on the right was lost. The obturator has yet to be completely renewed; it has been adjusted by changing it. The patient still uses her implant-supported obturator even after four years.

DISCUSSION

Adenoid cystic carcinoma most commonly occurs in the minor salivary glands[4]. Foote and Frazel were the first to describe that ACC was located in the major and minor salivary glands. They suggested that a relatively conservative surgical approach leads to high failure rates and advocated a more radical surgical treatment. This tumor is generally has very aggressive character[9]. In treating tumors formed in the maxilla, the maxilla is resected to prevent malignant change. Despite the lack of clarity in the data, patients with intermediate or high-grade ACC or any grade tumor with positive surgical margins are recommended to have postoperative radiation treatment to 60 Gy or more. Patients with an irresectable tumor are generally offered radiation therapy with or without systemic treatment but have poorer outcomes[10]. Reconstruction is challenging in maxillary resections as in other resections. The choice of the method that provides the appropriate rehabilitation for the patients and the type of obturator gains importance in terms of function. The size and extent of the defect area formed after maxillectomy, the number of remaining teeth, and the quality of the remaining alveolar bone are essential factors in determining the reconstruction method. Obturators are prosthetic appliances applied for occlusion of defects that cannot be fully closed with surgical procedures, which can cause some complications as a result of the fusion of the oral and nasal cavities, which occur with partial or total removal of the maxilla as a result of benign and malignant tumor resections, congenital deformities and traumatic reasons[11]. Satisfactory functional and cosmetic results have been reported as a result of rehabilitation using obturator prostheses. For example, in their study, Sharma and Beumer, in the rehabilitation treatment of defects involving the hard palate, reported that obturator prostheses are the most effective method in restoring speech, swallowing and chewing functions and facial aesthetics[11]. After radical treatments such as resection, rapid and adequate prosthetic rehabilitation is vital for maintaining and restoring quality of life. In our present case, the patient's speech, chewing, swallowing, and hypernasality disorders were almost entirely resolved after the obturator prosthesis was inserted. A pleasing aesthetic is provided to the patient.

CONCLUSION

Rehabilitation of maxillary defects with an implant-supported obturator prosthesis is a good option for rehabilitating patients. The patient regains swallowing, chewing, and speaking functions quickly and can participate in a normal social life.

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CASE REPORT

Adenoid Cystic Carcinoma: A Case Report

Doğan Ilgaz Kaya[1], Ziya Ozan Cengiz[2], Beyza Öztaş[3], Gökhan Varlı[3]

[1]Karamanoğlu Mehmetbey University, Faculty of Dentistry, Oral and Maxillofacial Department, Karaman, Turkey
[2]Selcuk University, Faculty of Dentistry, Oral and Maxillofacial Department, Konya, Turkey
[3]Karamanoğlu Mehmetbey University, Faculty of Medicine, Department of Medical Pathology, Karaman, Turkey

ABSTRACT

Introduction: Adenoid cystic carcinoma (ACC) is a rare cancer originating from the salivary glands, displaying an indolent growth pattern but aggressive progression. Early diagnosis is crucial due to the high metastatic potential and recurrence rate associated with ACC. This case report aims to contribute to the understanding and timely identification of ACC and its impact on patient management.

Case: A 42-year-old male patient presented with bleeding and swelling of the gingiva in the right upper molar region. Radiological examination revealed a radiolucent lesion causing bone resorption. An excisional biopsy confirmed the diagnosis of ACC.

Discussion: ACC poses diagnostic challenges due to its diverse clinical features and histological types, often leading to delayed detection. A prompt diagnosis is essential for effective management. This case report emphasizes the importance of early detection and highlights the clinical and pathological aspects of ACC, aiding in its recognition and appropriate treatment.

Key words: adenoid cystic carcinoma, head and neck cancer, salivary gland tumors

INTRODUCTION

Adenoid cystic carcinoma (ACC) is a very rare malignant neoplasm of the salivary glands[1]. ACC is most commonly observed in the salivary glands in the body. ACC is a rare tumor type, accounting for only 1% of all malignant tumors of the head and neck and 10% of total salivary gland neoplasms. ACC is more prevalent in the minor salivary glands than in the major salivary glands[2]. Additional regions of localization in the head and neck also include the tongue, palate, lacrimal glands, paranasal sinuses, and nasopharynx, as well as the external auditory canal. ACC can also arise in secretory glands in other tissues such as the tracheobronchial tree, oesophagus, breast, lung, prostate, cervix, Bartholin's glands, and vulva[2]. ACC is a slow-growing but aggressive neoplasm with a high recurrence rate[3]. It is characterized by a prolonged clinical course and the late onset of distant metastases. Distant metastases and regional lymph node involvement usually occur late in the course of the disease, many years after diagnosis. The organ involved in distant metastases is usually the lung, but bone, liver, and brain metastases have also been reported. Invasion of adjacent structures is quite aggressive, and hematogenous spread is more common than lymphatic spread. Perineural invasion is characteristic and occurs in more than 60% of cases[4].

The aim of this report is to present a case with a histopathological diagnosis of ACC causing bone destruction in the posterior molar region of the right maxilla and to contribute to the early diagnosis of oral cancer.

Submission Date: March 18, 2024
Acceptance Date: May 6, 2024
Corresponding author: Ziya Ozan Cengiz
Address: Selcuk University, Faculty of Dentistry, Department of Clinical Sciences, Department of Oral, Dental and Maxillofacial Surgery
Phone: 0543 825 37 63
Email: fulyaidil1@gmail.com

EurAsian Journal of Oral and Maxillofacial Surgery
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CASE

A 42-year-old male patient was admitted to Karamanoğlu Mehmetbey University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery with bleeding and swelling of the gingiva in the region of the right upper molar. The patient's medical history revealed that he had a tooth extracted in the same area approximately 1.5 years ago. Clinical examination revealed a painless, hyperemic lesion on the alveolar mucosa (Figure 1). Radiological examination revealed a radiolucent lesion with indistinct margins in the right maxillary molar region, causing resorption of the alveolar bone on the panoramic radiograph (Figure 2). An excisional biopsy was taken under local anesthesia and sent for histopathological examination.

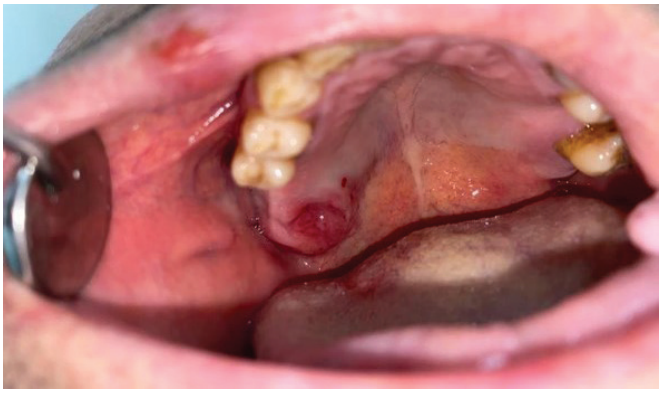

Figure 1: The intraoral appearance of the lesion as observed during a clinical examination.

Histopathological examination revealed a tumor structure consisting of myoepithelial and ductal cells with round pseudocystic areas. These cystic areas were filled with amorphous material. Basophilic glucosaminoglycans were histochemically positive for Alcian blue. Myoepithelial cells were immunohistochemically positive for p63 staining, and ductal cells were immunohistochemically positive for CK7.

Resection was performed under general anesthesia using an extraoral approach to include hard and soft tissues, and then a pedicled flap was transferred from the cheek area and closed primarily. The patient has been under control for 1 year, and no recurrence has been observed (Figure 3).

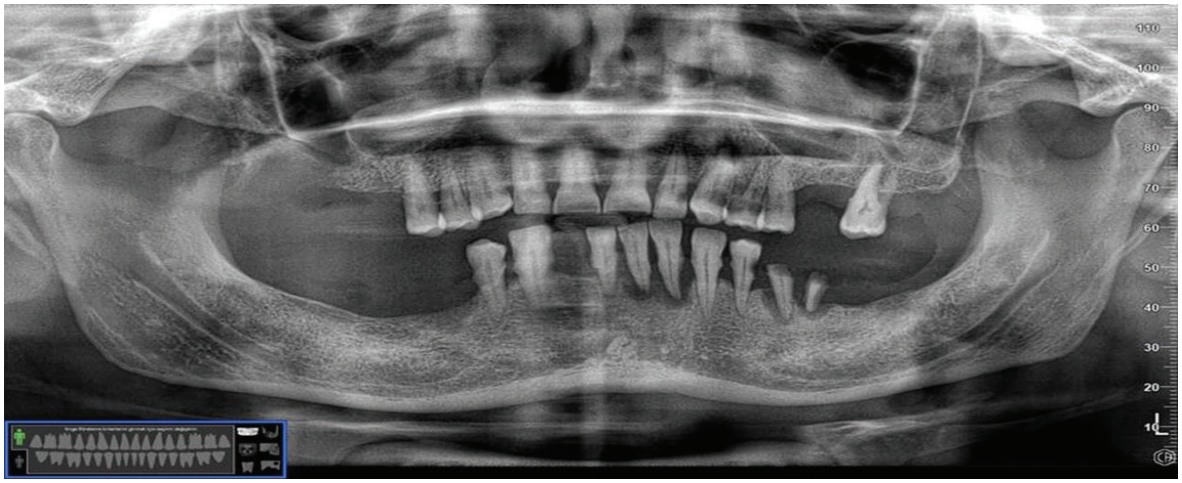

Figure 2: A panoramic image was obtained prior to the procedure.

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Figure 3: A panoramic view of the first year postoperatively.

DISCUSSION

ACC was first described in 1856 and named 'Cylindroma' due to its histological character of interweaving epithelial and connective tissue elements. The term 'adenoid cystic carcinoma' was defined by Ewing in 1954[5,6]. The lesion occurs predominantly in females and in the 5th and 6th decades of life. This case report presents a case of ACC in a 42-year-old male patient. Due to the slow growth of the tumor, it is characterized by the presence of the lesion for several years when patients present for treatment. In addition, pain, facial paralysis, and perineural invasion may be observed[6]. However, our patient did not have nerve involvement, as it was detected at an early stage.

The best way to treat local ACC is with surgery, resulting in total resection and negative surgical margins with no significant loss of organ function[7]. In spite of proper surgical technique, 5- to 10-year recurrence ratios have been reported to range from 30% to 75%[8]. Especially in the case of metastases, the survival rates drop significantly, with equally increased recurrence rates of up to 60%[9]. One strategy proposed in the literature to reduce local recurrence is postoperative radiotherapy. Although data from randomized trials is lacking, some studies suggest that this treatment is beneficial[10]. The majority of ACC types have slowly progressing growth dynamics and do not benefit from systemic chemotherapy. However, various chemotherapy studies have been conducted over the years. Previous studies have demonstrated that response rates to cytotoxic chemotherapy for ACC are consistently low. Consequently, there is no established standard of care for the systemic chemotherapy of patients with ACC tumors[2].

Particularly in the case of malignant lesions, early detection and treatment planning are crucial to prolong survival and prevent metastasis to distant sites. After diagnosis and treatment, ACC cases should be followed for many years because of the risk of recurrence.

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