ORIGINAL PAPER

AWARENESS-KNOWLEDGE LEVEL AND PRACTICE OF TWO DENTISTRY SPECIALTIES DENTISTS REGARDING JUXTA-APICAL RADIOLUCENCY

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ABSTRACT

Introduction: Mandibular third molar extraction is one of the most common procedures in oral and maxillofacial surgery. The procedure may result in several complications, such as injury of inferior alveolar nerve (IAN) and post-operative paresthesia/dysesthesia.

Objectives: To evaluate the awareness-knowledge level and practice of dentists who received specialization training in oral and maxillofacial radiology and oral and maxillofacial surgery regarding juxta-apical radiolucency (JAR).

Material and methods: Dentist participants who received specialization training and volunteered to participate were divided into two groups according to their specialization: group 1 – oral and maxillofacial radiology; group 2 – oral and maxillofacial surgery. A special questionnaire was prepared for this study and participants provided answers face-to-face. The form consisted of two parts: part 1 – personal information, and part 2 – awareness-knowledge level and practice regarding JAR. In part 2, dentists were asked questions on different panoramic radiography images containing JAR in a slide show. Pearson's χ^2 test was applied for statistical analysis.

Results: A total of 66 volunteers divided into two groups [group 1: $n = 32$ (43%); group 2: $n = 34$ (57%)] participated in the current study. The preliminary diagnosis of JAR was mostly associated with anatomical formation (group 1: 63.1%; group 2: 64.1%) and odontogenic/non-odontogenic lesions (group 1: 41.8%; group 2: 48.2%). Usually, participants thought that such a radiolucency would affect extraction method (group 1: 68.8%; group 2: 63.5%), posed a risk for IAN (group 1: 67.5%; group 2: 69.4%), and negatively affect healing process (group 1: 66.3%; group 2: 61.2%). A small ratio of participants was aware of JAR (group 1: 18.8%; group 2: 2.9%).

Conclusions: The awareness-knowledge level of dentists who received training in oral and maxillofacial radiology and oral and maxillofacial surgery regarding JAR was low. The practice of participants of both specialties towards JAR were variable.

Key words: juxta-apical radiolucency, third molar, panoramic radiography.

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INTRODUCTION

Mandibular third molar extraction is one of the most common procedures in oral and maxillofacial surgery. The procedure may result in several complications, such as injury of inferior alveolar nerve (IAN) and post-operative paresthesia/dysesthesia [1, 2]. Recent studies have reported that the ratio of IAN changes, ranging from 0.35% to 8% after procedure [1, 3-5]. Pre-operative radiological examination is very important to minimize the rate

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of complications, and to manage surgical procedure successfully. Panoramic radiography is the most used imaging method in dentistry, in which the condition of third molars is frequently evaluated. It has many advantages, such as supporting the main image of maxilla and mandible, low cost, and low radiation dose [6]. On a panoramic radiographic image, different radiographic signs that affect the mandibular third molar extraction process are visible. These include increased radiolucency of roots, diversion and narrowing of the mandibular canal, and interruption of cortical line of the mandibular canal [7, 8]. In 2005, a new radiographic sign has been observed as juxta-apical radiolucency (JAR). The radiological appearance of JAR is a well-defined radiolucent area located laterally in the mandibular third molar roots [3]. JAR is identified with specific radiographic features, and has been usually reported in association with vertical and mesio-angular positions, incomplete root formation, and unerupted or partially erupted mandibular third molars. The entity is located superior to the mandibular canal and in the distal of mandibular third molars' roots. The JAR size is mostly smaller than four millimeters [9-12]. Etiologically, it has been defined as an increase in cancellous bone space or string of different trabeculation in the cancellous bony architecture instead of pathology [9, 10, 12].

The prevalence of JAR has been reported 11% when using panoramic radiography and 33% with cone-beam computed tomography (CBCT). It has been observed higher in females, and in the second and third decades [9]. It has been suggested that the presence of JAR may be a risk factor for inferior alveolar nerve injury during mandibular third molar extraction [3]. In recent years, several radiological and clinical studies have been conducted on JAR to investigate its prevalence, characterization, and possible risk for mandibular third molar extraction [3, 9-15]. However, the awareness-knowledge level and practice of dentists regarding the relatively new entity have not been investigated.

OBJECTIVES

The aim of the present study was to evaluate the awareness-knowledge level and practice of dentists who received specialization training in oral and maxillofacial radiology and oral and maxillofacial surgery regarding JAR.

MATERIAL AND METHODS

The present study was approved by Gazi University Ethics' Committee (Approval No.: 2022-971). Dentists who received training in two different specialties of Gazi University were included in the study. Participation was on a voluntary basis, and identity information of participants were not recorded. Dentists were divided into two groups according to their specialty training: group 1 – oral and maxillofacial radiology; and group 2 – oral and maxillofacial surgery. A special questionnaire was prepared for this study consisting of two parts (Table 1). In part 1, there were four questions about personal information of participants. Part 2 included 31 questions about the awareness-knowledge level and practice of participants regarding JAR. Panoramic radiography images with JAR as a slide show were prepared for these questions. In the preparation of these images, archive records of panoramic radiographs obtained with Sirona Orthophos XG device (70 kVp, 8 milliampere, 14 seconds; Sirona, Bensheim, Germany) due to any dental reason in Gazi University Faculty of Dentistry, Oral and Maxillofacial Radiology Clinic were used. Radiographs were firstly evaluated by two researchers with four and seven years of experience in oral and maxillofacial radiology. Within the literature, 10 radiographs that were determined to have JAR were selected in a consensus [3, 9-15]. Then, a meeting was conducted with two oral and maxillofacial radiologists who selected the images, researchers with 24 years of experience in oral and maxillofacial radiology and 12 years of experience in oral and maxillofacial surgery. As a result, five of the images were selected and were used in the study (Figure 1). The questions were the same for each of the radiography images. Therefore, a total of 30 questions were included for a total of five radiography images (5 images × 6 questions = 30 questions). The final question was about the JAR awareness.

Participants were invited into a classroom, in a quiet environment with reduced light, and the questionnaires

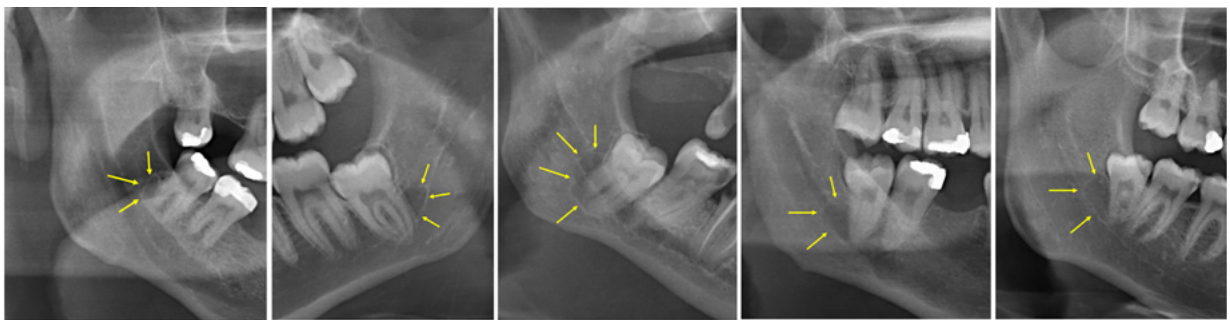

FIGURE 1. Cropped panoramic radiography images with JAR indicated with arrows

TABLE 1. Special questionnaire prepared for the present study

Part 1. Personal information	
Age (years)	
Sex	Female
	Male
Specialty	Oral and maxillofacial radiology
	Oral and maxillofacial surgery
Specialty training duration	< 2 years
	≥ 2 years
Part 2. The awareness-knowledge level and practice of the participants regarding juxta-apical radiolucency	
1. Which of the following do you think is the preliminary diagnosis of radiolucency indicated with arrows on the cropped panoramic radiography image?*	
Increasing in cancellous bone space	Artefact
Bone marrow defect	Anatomic formations • Accessory mandibular canal • Enlarged mandibular canal • Anatomic variation • Sub-mandibular fossa • Retromolar canal • Canalis sinuous
Juxta-apical radiolucency	
Chronic apical periodontitis	
Odontogenic/ non-odontogenic lesions • Dentigerous cyst • Odontogenic myxoma • Periapical osseous dysplasia • Radicular cyst • Odontogenic keratocyst • Pericoronitis • Ameloblastoma • Stafne bone defect • Tumor of neuron origin (neurolemma, neuroma etc.) • Dilated odontoma	Others# • Enlargement periodontal ligament space • Periodontal ligament space-mandibular canal superposition
2. Which way do you follow when you detect a radiolucency indicated with arrows on a cropped panoramic radiography image?*	
I detailly evaluate with clinical examination • In terms of symptoms and signs • A vitality test	Additionally, I evaluate with biopsy • An aspiration biopsy • An incisional biopsy • An excisional biopsy
Additionally, I evaluate with radiography image methods • Periapical radiography • Cone-beam computed tomography • Magnetic resonance image	Others • Routine radiographic follow-up • I do not make any attempts, further viewing prompts, or follow-up suggestions
3. Do you think the radiolucency indicated with arrows on the cropped panoramic radiography image should be reported in radiology reports?	
Yes	No
4. Do you think the radiolucency indicated with arrows on the cropped panoramic radiography image affect mandibular third molar extraction method?	
Yes	No
5. Do you think the radiolucency indicated with arrows on cropped panoramic radiography images poses a risk factor for mandibular nerve injury associated with mandibular third molar extraction?	
Yes	No
6. Do you think the radiolucency marked with arrows in cropped panoramic radiography images negatively affects healing process of the operation area after mandibular third molar extraction?	
Yes	No

**Multiple-choice*

were distributed. Questions related to radiography images were provided as a slide show by all researchers. To answer the questions, a total of 30 minutes were allocated, with one minute for each question. At the end of the period, the forms were collected. The obtained data was compared between the groups.

STATISTICAL ANALYSES

Power analysis was performed to calculate minimum sample size using Epi-Info 6.04 program. Margin of error was 5% ($\alpha = 0.05$), medium effect size was 5% ($d = 0.05$), and confidence level was 80% ($1 - \beta = 0.80$). According to the results of analysis, the minimum sample size was found to be 64. Data were analyzed using Statistical Package for Social Sciences (SPSS) for Windows version 22.0 (SPSS Inc., Chicago, USA) software. In the descriptive statistics section, categorical variables were presented as numbers and percentages, and continuous variables were presented as mean ± standard deviation and median (minimum-maximum value). χ^2 was applied for comparison analysis of categorical variables. Significance level was set at 5%.

RESULTS

In the present study, 66 volunteer participants were included. Personal information of the participants are presented in Table 2. In Table 3, the awareness-knowledge and practice of the participants regarding JAR are presented. The most rate was marked in the anatomical formation (group 1: 63.1%, and group 2: 64.1%) and odontogenic/non-odontogenic lesions (group 1: 41.8%, and group 2: 48.2%) by each group for preliminary diagnosis. The least rate was marked for JAR (13.8%) and others (10.6%) by group 1, and JAR (7.6%) and artefact (12.4%) by group 2 for preliminary diagnosis. The marking rate of the option 'increasing in cancellous bone space' for preliminary diagnosis differed statistically between the groups ($p = 0.010$).

TABLE 2. Personal information of the study's participants, *n* (%)

Personal information	
Age (years), mean ± SD	28.27 ± 3.41
Sex, *n* (%)	
Female	39 (59)
Male	27 (40)
Specialty, *n* (%)	
Oral and maxillofacial radiology	32 (47)
Oral and maxillofacial surgery	34 (53)
Specialty training duration, *n* (%)	
< 2 years	31 (47)
≥ 2 years	35 (53)

Statistical difference between the groups on the question whether JAR should be reported in radiology reports ($p = 0.006$) was found. The participants stated that if they saw such a radiolucency, they would often use additional radiography imagining methods (group 1: 86.9%, and group 2: 88.8%). Most participants thought that such a radiolucency would affect the extraction method (group 1: 68.8%, and group 2: 63.5%), posed a risk for IAN (group 1: 67.5%, and group 2: 69.4%), and negatively affect healing process (group 1: 66.3%, and group 2: 61.2%) (Table 3). In the last question, the participants were asked which were the rare radiological entities they had heard before. The awareness regarding these entities was statistically different between the two groups ($p = 0.001$). The difference was due to the term 'canalis sinuosus'. In both the groups, the dentists were least aware of JAR: group 1: 6 (18.8%), and group 2: 1 (2.9%) (Table 4).

DISCUSSION

Previous studies have reported the radiographic characteristics and possible clinical effects of JAR [3, 9-15]. Unlike these studies, the present research focused on the awareness-knowledge level and practice of dentists who received appropriate specialization training regarding relatively new entity, JAR.

In previous studies, there were differences in the radiographic appearance definition of JAR. Renton *et al.* [3] reported that JAR can be an advance of the lamella of IAN with the dental lamina dura. Umar *et al.* [16] claimed that JAR is an image artifact originated by superimposition of the mandibular canal on large cancellous bone spaces rather than pathology. Nascimento *et al.* [12] and Yalcin-Artas [10] identified JAR as an increase of the separation of trabeculae in the cancellous bone. The definitions usually pointed to possible anatomical changes/variations rather than pathology [3]. In the present study, when the preliminary diagnosis of radiolucency on the radiographic images was questioned, the 'anatomical formation' option was mostly marked, while the 'JAR' option was marked as the least. According to this finding, it can be said that the participants were not aware of the relatively new term, JAR, which has been defined in recent years.

JAR should be distinguished from different anatomical and pathological formations. JAR can be interpreted radiographically as odontogenic or non-odontogenic lesions, such as focal bone dysplasia and inflammatory periapical lesion [9, 17]. In order to avoid this confusion, it is necessary to correctly distinguish the lesion from similar lesions considering the characteristics of the special image and all distinguishing features. Focal bone dysplasia with radiological appearance similar

TABLE 3. Distribution of the awareness-knowledge level and practice of the participants regarding JAR, n (%)

Items	Image 1		Image 2		Image 3		Image 4		Image 5		Total (All images)		
	Group 1 *n* = 32 (%)	Group 2 *n* = 34 (%)	Group 1 *n* = 32 (%)	Group 2 *n* = 34 (%)	Group 1 *n* = 32 (%)	Group 2 *n* = 34 (%)	Group 1 *n* = 32 (%)	Group 2 *n* = 34 (%)	Group 1 *n* = 32 (%)	Group 2 *n* = 34 (%)	Group 1 *n* (%)	Group 2 *n* (%)	*p*-value
1. Which of the following do you think is the preliminary diagnosis of radiolucency indicated with arrows on the cropped panoramic radiography image?[&]													
Increasing in cancellous bone space	21 (65.6)	14 (41.0)	9 (28.1)	9 (26.4)	9 (28.1)	6 (17.6)	10 (31.2)	6 (17.6)	15 (46.8)	11 (32.3)	64 (40.6)	46 (27.1)	0.010*
Bone marrow defect	16 (50.0)	8 (23.5)	8 (25.0)	7 (20.5)	7 (21.8)	7 (20.5)	6 (18.7)	5 (14.7)	7 (21.8)	6 (17.6)	44 (28.1)	33 (19.4)	0.070
Juxta-apical radiolucency	4 (12.5)	2 (5.8)	3 (9.3)	1 (2.9)	8 (25.0)	5 (14.7)	5 (15.6)	3 (8.8)	2 (6.2)	2 (5.8)	22 (13.8)	13 (7.6)	0.077
Chronic apical periodontitis	6 (18.7)	7 (20.5)	–	1 (2.9)	10 (31.2)	12 (35.2)	13 (40.6)	10 (29.4)	2 (6.2)	5 (14.7)	31 (19.9)	35 (20.1)	0.555
Odontogenic/ non-odontogenic lesions[#]													
Dentigerous cyst	1 (3.1)	3 (8.8)	–	2 (5.8)	4 (12.5)	4 (11.7)	–	1 (2.9)	–	4 (11.7)	65 (41.8)	82 (48.2)	0.121
Odontogenic myxoma	1 (3.1)	6 (17.6)	2 (6.2)	2 (5.8)	2 (6.2)	5 (14.7)	–	2 (5.8)	2 (6.2)	1 (2.9)			
Periapical osseous dysplasia	2 (6.2)	3 (8.8)	–	1 (2.9)	4 (12.5)	5 (14.7)	3 (8.8)	2 (5.8)	1 (3.1)	2 (5.8)			
Radicular cyst	3 (9.3)	7 (20.5)	–	–	5 (15.6)	10 (29.4)	4 (12.5)	5 (14.7)	1 (3.1)	4 (11.7)			
Odontogenic keratocyst	–	5 (14.7)	1 (3.1)	3 (8.8)	4 (12.5)	7 (20.5)	4 (12.5)	2 (5.8)	3 (9.3)	4 (11.7)			
Pericoronitis	1 (3.1)	–	2 (6.2)	–	1 (3.1)	–	–	1 (2.9)	–	–			
Ameloblastoma	2 (6.2)	5 (14.7)	1 (3.1)	2 (5.8)	1 (3.1)	4 (11.7)	–	1 (2.9)	1 (3.1)	2 (5.8)			
Stafne bone defect	3 (9.3)	2 (5.8)	2 (6.2)	3 (8.8)	1 (3.1)	1 (2.9)	–	1 (2.9)	3 (9.3)	–			
Tumor of neuron origin (neurolemma, neuroma etc.)	2 (6.2)	2 (5.8)	10 (31.2)	8 (23.5)	4 (12.5)	2 (5.8)	5 (15.6)	6 (17.6)	3 (9.3)	2 (5.8)			
Dilated odontoma	1 (3.1)	1 (2.9)	–	–	–	–	–	–	–	–			
Anatomic formations[#]													
Accessory mandibular canal	8 (25.0)	2 (5.8)	13 (40.6)	6 (17.6)	6 (18.7)	3 (8.8)	4 (12.5)	6 (17.6)	11 (34.3)	7 (20.5)	101 (63.1)	109 (64.1)	0.909
Enlarged mandibular canal	1 (3.1)	2 (5.8)	20 (62.5)	22 (64.7)	2 (6.2)	6 (17.6)	11 (34.3)	21 (61.7)	7 (21.8)	13 (38.2)			
Anatomic variation	12 (37.5)	16 (47.1)	11 (34.3)	13 (38.2)	11 (34.3)	8 (23.5)	6 (18.7)	6 (17.6)	15 (46.8)	8 (23.5)			
Sub-mandibular fossa	–	–	2 (6.2)	3 (8.8)	3 (9.3)	1 (2.9)	2 (6.2)	6 (17.6)	3 (9.3)	3 (8.8)			
Retromolar canal	4 (12.5)	6 (17.6)	2 (6.2)	4 (11.7)	–	1 (2.9)	1 (3.1)	3 (8.8)	3 (9.3)	3 (8.8)			
Canalis sinuous	2 (6.2)	1 (2.9)	1 (3.1)	1 (2.9)	1 (3.1)	–	1 (3.1)	–	–	1 (2.9)			
Artefact	6 (18.7)	6 (17.6)	7 (21.8)	4 (11.7)	6 (18.7)	–	5 (15.6)	4 (11.7)	7 (21.8)	2 (5.8)	31 (17.5)	21 (12.4)	0.216
Others[#]													
Enlargement periodontal ligament space	1 (3.1)	3 (8.8)	1 (3.1)	–	4 (12.5)	3 (8.8)	3 (9.3)	2 (5.8)	–	2 (5.8)	17 (10.6)	24 (14.1)	0.405
Periodontal ligament space-mandibular canal superposition	1 (3.1)	5 (14.7)	1 (3.1)	4 (11.7)	2 (6.2)	2 (5.8)	4 (12.5)	3 (8.8)	4 (12.5)	2 (5.8)			

TABLE 3. Cont.

Items	Image 1		Image 2		Image 3		Image 4		Image 5		Total (All images)		
	Group 1 $n=32$ (%)	Group 2 $n=34$ (%)	Group 1 $n=32$ (%)	Group 2 $n=34$ (%)	Group 1 $n=32$ (%)	Group 2 $n=34$ (%)	Group 1 $n=32$ (%)	Group 2 $n=34$ (%)	Group 1 $n=32$ (%)	Group 2 $n=34$ (%)	Group 1 n (%)	Group 2 n (%)	p-value
2. Which way do you follow when you detect the radiolucency indicated with arrows on the cropped panoramic radiography image?[&]													
I detailly evaluate with the clinical examination[#]													
In terms of symptoms and signs	22 (68.8)	25 (73.5)	19 (59.4)	19 (55.9)	22 (68.8)	18 (52.9)	17(53.1)	17 (50.0)	17 (53.1)	16 (47.1)	104 (65.0)	105 (61.8)	0.569
A vitality test	17 (53.1)	20 (58.8)	7 (21.9)	9 (26.5)	10 (31.3)	7 (20.6)	9 (28.1)	8 (23.5)	6 (18.8)	8 (23.5)			
Additionally, I evaluate with radiography image methods[#]													
Periapical radiography	22 (68.8)	21 (61.8)	17 (53.1)	11 (32.4)	18 (56.3)	15 (44.1)	20 (62.5)	12 (35.3)	19 (59.4)	13 (38.2)	139 (86.9)	151 (88.8)	0.616
Cone-beam computed tomography	14 (43.8)	27 (79.4)	22 (68.8)	27 (79.4)	25 (78.1)	30 (88.2)	20 (62.5)	26 (76.5)	21 (65.6)	28 (82.4)			
Magnetic resonance image	–	–	1 (3.1)	3 (8.8)	1 (3.1)	4 (11.8)	3 (9.4)	5 (14.7)	–	3 (8.8)			
Additionally, I evaluate with biopsy[#]													
An aspiration biopsy	2 (6.3)	4 (11.8)	1 (3.1)	1 (2.9)	1 (3.1)	1 (2.9)	–	–	3 (9.4)	–	16 (10.0)	20 (11.8)	0.724
An incisional biopsy	–	1 (2.9)	–	1 (2.9)	1 (3.1)	2 (5.9)	–	1 (2.9)	–	1 (2.9)			
An excisional biopsy	1 (3.1)	4 (11.8)	1 (3.1)	2 (5.9)	3 (9.4)	4 (11.8)	1 (3.1)	1 (2.9)	1 (3.1)	2 (5.9)			
Others[#]													
Routine radiographic follow-up	17 (53.1)	16 (47.1)	17 (53.1)	13 (38.2)	15 (46.9)	8 (23.5)	16 (50.0)	10 (29.4)	20 (62.5)	4 (11.8)	87 (54.4)	56 (32.9)	0.000*
I do not make any attempts, further viewing prompts or follow-up suggestions	1 (3.1)	–	–	1 (2.9)	–	–	1 (3.1)	3 (8.8)	1 (3.1)	3 (8.8)			
3. Do you think the radiolucency indicated with arrows on the cropped panoramic radiography image should be reported in radiology reports?													
Yes	22 (68.8)	30 (88.2)	22 (68.8)	29 (85.3)	26 (81.3)	31 (91.2)	24 (75.0)	29 (85.3)	24 (75.0)	28 (82.4)	118 (73.8)	147 (86.5)	0.006*
No	10 (31.8)	4 (11.8)	10 (31.3)	5 (14.7)	6 (18.8)	3 (8.8)	8 (25.0)	5 (14.7)	8 (25.0)	6 (17.6)	42 (26.3)	23 (13.5)	
4. Do you think the radiolucency indicated with arrows on the cropped panoramic radiography image affect the mandibular third molar extraction method?													
Yes	19 (59.4)	17 (50.0)	26 (81.3)	25 (73.5)	24 (75.0)	29 (73.5)	21 (65.6)	20 (58.8)	20 (62.5)	21 (61.8)	110 (68.8)	108 (63.5)	0.353
No	13 (40.6)	17 (50.0)	6 (18.8)	9 (26.5)	8 (25.0)	9 (26.5)	11 (34.4)	14 (41.2)	12 (37.5)	13 (38.2)	50 (31.3)	62 (36.5)	
5. Do you think the radiolucency indicated with arrows on cropped panoramic radiography images poses a risk factor for mandibular nerve injury associated with mandibular third molar extraction?													
Yes	12 (37.5)	11 (32.4)	27 (84.4)	29 (85.3)	26 (81.3)	27 (79.4)	24 (75.0)	26 (76.5)	19 (59.4)	25 (73.5)	108 (67.5)	118 (69.4)	0.724
No	20 (62.5)	23 (67.6)	5 (15.6)	5 (14.7)	6 (18.8)	7 (20.6)	8 (25.0)	8 (23.5)	13 (40.6)	9 (26.5)	52 (32.5)	52 (30.6)	
6. Do you think the radiolucency marked with arrows in cropped panoramic radiography images negatively affects the healing process of the operation area after the mandibular third molar extraction?													
Yes	15 (46.9)	9 (26.5)	25 (78.1)	24 (70.6)	24 (75.0)	28 (82.4)	23 (71.9)	25 (73.5)	19 (59.4)	18 (52.9)	106 (66.3)	104 (61.2)	0.361
No	17 (53.1)	25 (73.5)	7 (21.9)	10 (29.4)	8 (25.0)	6 (17.6)	9 (28.1)	9 (26.5)	13 (40.6)	16 (47.1)	54 (33.8)	66 (38.8)	

[&]Multiple-choice.
**p-value statistically significant.*
[#]Even if the same person marked more than one lower option, it was accepted as having marked only one upper option in total column.

TABLE 4. Distribution of the awareness of the rare radiological entities according to specialty, *n* (%), and statistical analysis

Rare radiological entities	Groups		*p*-value
	Group 1 , *n* = 32	Group 2 , *n* = 34	
Canalis sinuosus, *n* (%)	25 (78.1)	12 (35.3)	0.001*
Retromolar canal, *n* (%)	22 (68.8)	29 (85.3)	0.662
Juxta-apical radiolucency, *n* (%)	6 (18.8)	1 (2.9)	0.763
Accessory mandibular canal, *n* (%)	31 (96.9)	32 (94.1)	0.893
None heard, *n* (%)	–	1 (2.9)	–

**Statistically significant*

to JAR can be seen in 5th decade patients and in any region of the jaw regardless of localization [17]. In contrast, JAR is usually seen in 3rd decade patients and distal to the mandibular third molar root [10]. Local factors, such as extensive coronal restoration, deep dentin caries, and absence of lamina dura provide important evidences in the diagnosis and differentiation of inflammatory periapical lesion whose radiological appearance may be confused with JAR [9]. In the present study, when all the answers given for the preliminary diagnosis were evaluated, the second most marked option was odontogenic/ non-odontogenic lesions. It is essential to know the clinical and radiographic features of JAR itself and formations, in which differential diagnosis will be made. This knowledge level eliminates misdiagnosis and subsequent mishandling of patients.

JAR can be detected in both conventional radiographic image methods, such as periapical and panoramic radiography, and advanced images methods, such as CBCT. Umar *et al.* [16] used CBCT to evaluate the superimposition of JAR, and the mandibular canal that was observed on conventional radiography. They reported JAR and the mandibular canal were not found always in contact, and identified the JAR as a large cancellous bone cavity. In the present study, most of the participants (group 1: 86.9%, and group 2: 88.8%) indicated that they would additionally examine using different radiography image methods if they encountered a relevant radiolucency. CBCT is often the preferred method for a detailed radiological examination in dentistry, as it provides a three-dimensional view of hard tissues.

There are studies examining whether the JAR is a risk factor for injury of IAN in mandibular third molar extraction. Renton *et al.* [3] reported that the JAR and deviation of the mandibular canal are significantly associated with IAN injury in patients who underwent mandibular third molar extractions with coronectomy. In contrast, Gilvetti *et al.* [14] reported that the presence of JAR did not cause permanent injury to the IAN during mandibular third molar extraction. In the present study, most of the participants (group 1: 67.5%, and group 2: 69.4%) marked that the relevant radiolucency may pose a risk factor for the injury of IAN during mandibular third molar extraction.

The present study has a few limitations. Because of the study structure, the participants could not state all their own preliminary diagnoses and the processes they would follow, as they could only choose from options presented in the questionnaire, so all views of the participants on radiolucency could not be evaluated. Since radiolucency that was accepted as the JAR is only a radiological definition, no pathological evaluation was made while selecting the images for the study.

CONCLUSIONS

Dentists who received specialization training in oral and maxillofacial radiology and oral and maxillofacial surgery had insufficient level of awareness and knowledge regarding the JAR, and their practices were variable when they encountered the entity.

Dentists who received specialization training in any field should be more interested in new entities and follow the current literature.

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CONFLICT OF INTERESTS

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

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