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The Use of Panoramic Radiography for Condyle Shape Detection on Menopausal Periods in Dentistry Radiology Installation – Dental and Oral Hospital of Universitas Sumatera Utara

Penggunaan Radiografi Panoramik untuk Mendeteksi Bentuk Kondilus pada Menopause di Instalasi Radiologi Kedokteran Gigi – Rumah Sakit Gigi dan Mulut Universitas Sumatera Utara

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Abstract

Panoramic radiographs can be used to detect temporomandibular morphology and condylar changes. This study shape-determines the female condyle in perimenopausal and postmenopausal using panoramic radiography. It used an observational survey technique with a sample of 80 people, consisting of 40 perimenopausal aged between 20 and 29, and 40 postmenopausal females aged over 52. The results on the perimenopausal condyle process obtained a round shape of 43.7%, an angle of 32.5%, and a pointed shape of 23.7%. Furthermore, the shape of the condylar process in postmenopause is 37.5% pointed, 30% angled, 25% round, and 7.5% flat. Data were analyzed using the Chi-Square test with a significance value of $p<0.05$. The results showed that changes in the size and shape of the condyles occur with age. There is a significant difference in the condyle shape between perimenopausal and postmenopausal periods.

Keywords: Panoramic, perimenopausal, postmenopausal, condylar shape

Abstrak

Morfologi temporomandibula dan perubahan pada kondilus dapat dideteksi menggunakan radiografi panoramik. Tujuan penelitian untuk mengetahui bentuk kondilus wanita pada *premenopause* dan *postmenopause* menggunakan radiografi panoramik. Jenis penelitian adalah survei observasional, dengan jumlah sampel sebanyak 80, terdiri dari 40 wanita premenopause berusia 20-29 tahun dan 40 wanita pascamenopause berusia di atas 52 tahun. Hasil penelitian pada prosesus kondilus *premenopause*, diperoleh bentuk bulat sebesar 43,7%, bersudut sebesar 32,5% dan runcing sebesar 23,7%. Bentuk prosesus kondilus pada *postmenopause* diperoleh bentuk runcing sebesar 37,5%, bersudut sebesar 30%, bulat sebesar 25% dan datar sebesar 7,5%. Analisis data menggunakan uji *Chi-Square* dengan nilai signifikansi $p<0,05$. Perubahan ukuran dan bentuk kondilus terjadi dengan bertambahnya usia. Kesimpulan adalah terdapat perbedaan signifikan pada bentuk kondilus antara premenopause dengan postmenopause.

Kata kunci: Panoramik, *premenopause*, *postmenopause*, bentuk kondilus

INTRODUCTION

The condylar process is the bony structure on the right and left sides of the mandible that is connected to the ramus. The ends of the condyles are called medial and lateral. The size and shape of the condylar process vary between mediolateral 15-20 mm and anteroposterior 8-10 mm.[1,2] Moreover, the condylar process has a round, flat, angular, and oval shape.[1-3] Panoramic radiographs are used to determine the temporomandibular morphology and condylar changes caused by temporomandibular disorders due to age or dental conditions.[1,4]

Syeda et al. (2016) examined the condyle shape using panoramic radiographs in several age groups. The age group of 20-40 years old had the flattest, 41-

60 years old had the smallest round, while 61-80 years old had angular condyles.[5]

Several factors cause changes in the condyle shape, such as malocclusion, trauma, endocrine disorders, and radiation therapy. Moreover, acquired genetic and functional factors, as well as age groups and individuals, affect condyle morphology changes.[5]

This study obtains data on the differences and prevalence of condyle forms in women that have experienced perimenopausal and postmenopausal periods.

MATERIAL AND METHOD

This study was conducted at the Dentistry Radiology Installation, Dental and Oral Hospital, North Sumatra University. It employed an observational survey technique based on changes in time with a cross-sectional approach. The study obtained an ethics commission permit no: 39/ TGL/KEPK FK USU-RSUP HAM/2018.

The sample in this study comprised 40 perimenopausal and 40 postmenopausal females. Inclusion criteria were used to select perimenopausal females aged between 20 and 29 and postmenopausal females aged over 52. Exclusion criteria were based on the history of fracture or trauma with involvement of the condylar process.

Panoramic radiography was performed on the sample using Instrumentarium OC 200with a digital sensor system. The results were visible on the computer and checked using cliniview software. Copies of the results were then made to produce the same panoramic radiograph as the original. Panoramic radiographic observations were carried out on the condyle process using computer software. The outlines of the condylar process were observed visually and grouped based on their shape as flat, angular, round, and pointed. The interpretation was carried out through observation by two researchers.

Data were analyzed using the Chi-Square test to determine the difference with a significance value of $p<0.05$.

RESULT

Table 1. Shape distribution of the condylar processes in perimenopausal and postmenopausal females.

Shape of condyle	perimenopausal		postmenopausal	
	N	%	N	%
Flat	0	0	6	7.5
Pointed	19	23.7	30	37.5
Angle	26	32.5	24	30
Round	35	43.7	20	25
Total	80	100	80	100

Table 2. Shape Comparison of the right-sided condylar process in perimenopausal and postmenopausal females.

left side	Shape of condyle								*P*
	Flat		Pointed		Angle		Round		
	n	%	n	%	n	%	n	%	
Peri	0	0	9	22.5	15	37.5	16	40	<0.0
Post	2	5	18	45	11	27.5	9	22.5	001[a]

a. Chi-Square test

Table 3. Shape Comparison of the left-sided condylar processes in perimenopausal and postmenopausal females.

Right side	Shape of condyle								
	Flat		Pointed		Angle		Round		
	n	%	n	%	n	%	n	%	*P*
Peri	0	0	10	25	11	27.5	19	47.5	<0.0
Post	4	10	12	30	13	32.5	11	27.5	001[a]

a. Chi-Square test

DISCUSSION

Mandibular condyles in asymptomatic patients show different shapes on panoramic radiographs. The round and elbow shapes are the most common, especially in younger patients.[6,7] Changes in the shape and size of the condyles may occur with age. A flat shape in asymptomatic patients is generally suspected of pathological symptoms. It is closely associated with Temporo Mandibular Joint (TMJ) abnormalities, condylar bone changes such as erosions, osteophytes, and deformities.[8]

The results show that in the perimenopausal females, the round shapes were the most common by 43.7%, followed by angular with 32.5%, pointed with 23.7%, and no flat shape. In postmenopausal females, the most common shapes were sharp by 37.5%, followed by angular with 30%, round with 25%, and flat with 7.5%. Oliveira et al. (2009) examined 171 females aged between 20 and 69. The results showed that the common shape was round by 41.52%, followed by angclarity 29.82%, pointed with 25.73%, and flat with 2.92%.[8]

Sonal et al. (2016) 101 examined females aged between 18 and 62 and found that the most common shapes were round with 67%, followed by pointed with 29%, angular with 9%, and flat with 2%.[2] Lemke et al. (2010) stated that significant changes in the condyle shape occur during childhood.[9,10]

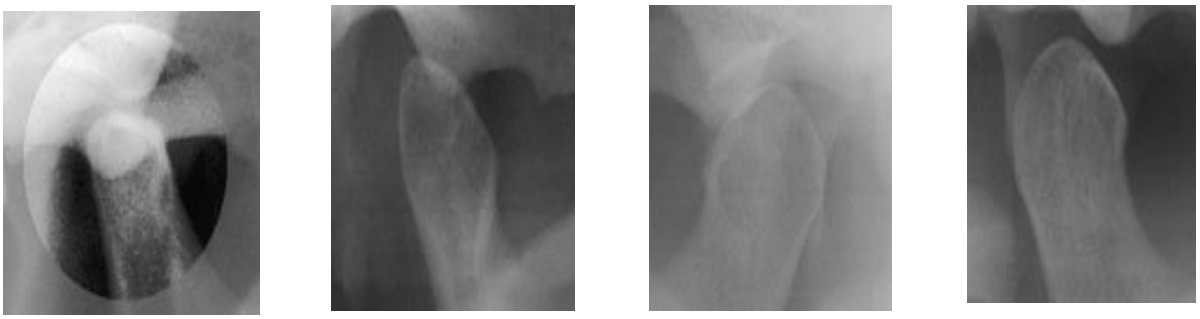
Differences in the growth of the condylar processes are also caused by the asymmetric activity of the mas-

ticatory or one-sided muscles.[11] In line with this, Tecco S et at. (2020) stated that the condyle process adapts to the funtional stimulus.[12]

In younger patients, the condyle is usually round but keeps changing as they age. In the elderly, a pointed, rounded, and angular condyle shape may appear with equal frequency.[3,11] The condyle shape process in each individual is different. This is true even when the same individual has a different condyle shape on the right and left sides because it is a normal variation.[12,13]

Occlusion problems during growth cause continuous changes in the position of the condyle process in the glenoid fossa. The problems result in different growth of the condyle on the right and left sides.[14] The arising differences are unique to each individual due to the adaptation of the functional stimulus. As a result, they cause different shape and volume differences between different age groups and individuals.[13,15] Therefore, there are significant differences in condyle shapes between perimenopausal and postmenopausal females.

Figures



a b c d

Figure 1. Types of condyle shapes (personal documentation) a. flat, b. pointed, c. angled, d. round

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