Academic year 2021./2022.

Course title

Research methods of temporomandibular joint skeletal structure forms and their comparison

Department

Department of Fixed Prosthodontics

Adress

Gundulićeva 5, 10000 Zagreb

Total ECTS points

2 ECTS

Course leader

Doc.dr.sc. Josip Kranjčić

Course associates

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Teaching plan

	No. classes
Lecture	5
Seminar	4
Practical	1
Total	10

1 class = 45 minutes

Course description

Temporomandibular joint (TMJ) is one of the most complex joints in the human body without which the function of masticatory system like chewing and speech would not be possible. Therefore, the TMJ area is very interesting to the doctors of dental medicine in both scientific and clinical sense. Osseous parts of the joint change and remodel during the life. Also, anatomical form of TMJ was affected by the evolutionary development of the human body. TMJ is a subject to many scientific and clinical researches during which different two and three dimensional methods of measurement are used, from simple to more complex and modern methods supported by computer technology. Each method has its advantages as well as disadvantages. Therefore, different methods are often compared to determine the differences in order to contribute to the precision of research in this scientific area.

For successful planning and conducting of research in this particular area, the students will first learn about anatomy and development of TMJ but also about the fact that human evolution had an impact on anatomical characteristics of modern man's TMJ. Related to TMJ anatomy, characteristics of TMJ articular eminence anatomy among modern and historical populations from Croatia and North America will be also presented. Basic biomechanics of TMJ will also be described. Through classes which will be organized in the form of lectures and seminars students will learn about the different methods used to research the form of TMJ skeletal structures with emphasis on articular eminence and glenoid fossa anatomy. Two and three dimensional methods of research of TMJ skeletal structures forms will be described together with different radiographic techniques. In order for students to be able to independently choose the right method and conduct a research, emphasis will

be put on describing of those methods and their mutual comparison. In the practical part students will make silicone impressions of articular eminence and glenoid fossa on human skull with a focus on parallelism of the silicone impression base with the Frankfurt horizontal plane. Preparation of the silicone impressions for two dimensional and three dimensional measurements (laser and optical scanning) will also be shown.

Learning outcomes

1. Describe the anatomical structures and basic biomechanics of temporomandibular joint
2. Specify basic methods for researching the skeletal structure forms of temporomandibular joint
3. Compare the methods of researching the temporomandibular joint anatomy
4. Choose a method, plan and conduct a research of anatomy of skeletal structures of temporomandibular joint

Course contet

Lecture

	Lecture topics	**Number of classes/hours**
1.	- Anatomy of temporomandibular joint	1
2.	-Growth, development and the impact of human evolution on the temporomandibular joint form	1
3.	-Basic biomechanics of temporomandibular joint	1
4.	-Research methods of the anatomy of temporomandibular joint skeletal structures	1
5.	- Temporomandibular joint characteristics in modern and historical populations from Croatia and North America	1
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Seminari

	Seminar topics	**Number of classes/hours**
1.	- Imaging of temporomandibular joint structures	1
2.	- Procedures of three dimensional laser and optical scanning of silicone samples of temporomandibular joint	1

3.	- Applying possibilities of radiographic images to analyze the articular eminence form of temporomandibular joint	1
4.	-Comparison of different techniques and results of anthropometric measurements of articular eminence of temporomandibular joint	1
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Vježbe

	practicals topics	**Number of classes/hours**
1.	-Making of samples – silicone impressions of articular eminence and glenoid fossa of temporomandibular joint on skeletal samples and preparation of samples for three dimensional scanning and measuring	1
2.	-	-
3.	-	-
4.	-	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 class = 45 minutes

Literature

1. Kranjčić J. Istraživanje antropometrijskih mjera zglobne kvržice temporomandibularnoga zgloba na historijskim uzorcima [dissertation]. Zagreb: Stomatološki fakultet Sveučilišta u Zagrebu; 2016. 232 p.

2. Okeson JP. Temporomandibularni poremećaji i okluzija. Zagreb: Medicinska naklada; 2008. ISBN: 978-953-176-384-4

3. Manfredini D. Current concepts on temporomandibular disorders. Berlin: Quintessence Publishing Co. Ltd. 2010. ISBN: 1-85097-199-4

4. Greene CS, Laskin DM. Treatment of TMDs: Bridging the gap between advances in research and clinical patient management. Hanover Park: Quintessence Publishing Co. Ltd. 2013. ISBN: 978-0-86715-586-0

5. Kranjčić J, Šlaus M, Peršić S, Vodanović M, Vojvodić D. Differences in skeletal components of temporomandibular joint of an early medieval and contemporary Croatian population obtained by different methods. Ann Anat. 2016;203:52-8.

6. Kranjčić J, Vojvodić D, Žabarović D, Vodanović M, Komar D, Mehulić K. Differences in articular-eminence inclination between medieval and contemporary human populations. Arch Oral Biol. 2012;57:1147-52.

7. Kranjčić J, Šlaus M, Vodanović M, Peršić S, Vojvodić D. Articular eminence inclination in medieval and contemporary Croatian population. Acta Clin Croat. 2016;55:529-34.

8. Kranjčić J, Hunt D, Peršić Kiršić S, Kovačić I, Vojvodić D. Articular eminence morphology of American historic and contemporary populations. Acta Stomatol Croat. 2021;55:397-405.

CV (*curriculum vitae*) and bibliography of course leader

Josip Kranjčić was born on February 19, 1986 in Zagreb. In 2004 he finished high school Zdravstveno učilište (dental technician programme) in Zagreb. In 2004 he enrolled at the School of Dental Medicine, University of Zagreb. He graduated in 2009 with graduate thesis "Interactions of adhesion systems with dentin". He completed a one-year internship at the Health Center Zagreb - East in Zagreb.

Since 2011 he has been employed as junior research assistant at the Department of Fixed Prosthodontics, School of Dental Medicine, University of Zagreb. In 2016 he completed postgraduate doctoral study at School of Dental Medicine, University of Zagreb by defending his doctoral thesis entitled "Research of anthropometric measures of temporomandibular joint's articular eminence on historic samples ". In 2016 he completed residency in prosthodontics. Since March 2017, he has been working as an assistant professor at the Department of Fixed Prosthodontics, School of Dental Medicine, University of Zagreb in the teaching base of Clinical Hospital Dubrava, where he has been employed as a specialist in prosthodontics since November 2018. He performs specialist diagnostics and therapeutic procedures in the field of prosthodontics within the clinical work and teaching process with students of the School of Dental Medicine, University of Zagreb. In the teaching process he participates in lectures, seminars, pre-clinical and clinical practicals. At postgraduate doctoral study of Dental Medicine, he is the leader of course entitled "Research methods of temporomandibular joint skeletal structure forms and their comparison."

He actively participated in international and domestic scientific conferences and congresses (oral presentations-lectures and poster presentations). In 2017, he received the award for the best poster presentation of research at the international EPA Congress - European Prosthodontic Association. He has been a collaborator on several scientific projects. He is the author of several chapters in university textbooks and the professional editor of one university textbook. He has worked as a reviewer of original scientific papers for numerous scientific and professional journals. He is a member of domestic and international professional and scientific organizations.

Bibliography of course leader:

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