Keywords: Digastric muscle; Pediatric normative data; Automated CT segmentation.

Fundings sources: No financial support was received for this study.

Disclosure statement: The authors declare no conflicts of interest.

References:

1. Wasserthal J, Breit HC, Meyer MT, et al. TotalSegmentator: robust segmentation of 104 anatomic structures in CT images. Radiol Artif Intell. 2023;5(5):e230024.
2. McCleary SP, Moghadam S, Le C, et al. Volumetric assessment of the anterior digastric muscles: a deeper understanding of the volumetric changes with aging. Aesthet Surg J. 2023;43(1):1–8.
3. Sporns KB, Hanning U, Schmidt R, et al. Volumetric assessment of swallowing muscles: a comparison of CT and MRI segmentation. Fortschr Röntgenstr. 2018;190(5):441–446.

https://doi.org/10.1016/j.aanat.2026.152967

MRI Findings of Jejunal Ectopic Pancreas Accompanied by Incomplete Pancreas Divisum

Asya Karaduman [1,*,#], Tuğrul Örmeci [2]

[1] *Department of Anatomy, Istanbul Medipol University, Türkiye*
[2] *Department of Radiology, Istanbul Health and Technology University, Türkiye*
[*] *Corresponding author.*
[#] *asya.karaduman@medipol.edu.tr*

Objective: This study aimed to present a rare case demonstrating the coexistence of ectopic pancreas and incomplete pancreas divisum, and to emphasize the radiological findings that may guide the diagnosis.

Methods and Materials: Abdominal imaging findings of a 72-year-old female patient with abdominal pain and a history of cholecystectomy were evaluated. Anatomical and radiological findings related to the biliary system, gastrointestinal tract, and pancreatic ductal anatomy were analyzed.

Results: Intravenous contrast-enhanced dynamic abdominal MRI revealed a lobulated lesion located at the proximal jejunum on the anterior mesenteric side, abutting the bowel wall. The lesion demonstrated signal intensity similar to pancreatic tissue on precontrast sequences and marked arterial phase enhancement paralleling the enhancement pattern of pancreatic parenchyma on postcontrast images. A linear T2 hyperintense structure suggestive of a small-caliber ductal component was identified within the lesion. Central umbilication/necrosis appearance ("umbilication sign") was also observed. Based on these findings, the lesion was interpreted as ectopic pancreas and subsequently verified by endoscopic biopsy. Additionally, pancreatic ductal anatomy demonstrated drainage of the dorsal pancreatic duct into the minor duodenal papilla, while the common bile duct and ventral pancreatic duct drained into the major papilla. A thin communication between the dorsal and ventral ducts was present, consistent with type 3 incomplete pancreas divisum.

Conclusion: Ectopic pancreas and pancreas divisum are rare congenital anomalies, and their coexistence is exceedingly uncommon. Recognition of characteristic radiological features such as enhancement pattern, presence of ductal structures, and the umbilication sign is important in differentiating these lesions from gastrointestinal mesenchymal tumors and malignancies.

Keywords: Ectopic pancreas; pancreas divisum; jejunal lesion

Fundings sources: No financial support was received for this study.

Disclosure statement: The authors have no conflict of interest to declare.

https://doi.org/10.1016/j.aanat.2026.152968

Evaluation of Anatomy Education and Curriculum in Physical Therapy and Rehabilitation Programs: The Imperative for a Discipline-Specific Model

Mahinur Rabia KARAKILIÇ [1,*,♯], Doç.Dr. Serdar BABACAN [2], Hatice ORTAÇ [3], Prof.Dr. Alper VATANSEVER [4], Prof.Dr. Gökhan OCAKOĞLU [5], Prof. Dr. Erdoğan ŞENDEMİR [6]

[1] *Bursa Uludag University, Faculty of Medicine, Department of Anatomy/Bursa, Turkey*
[2] *Bursa Uludag University, Faculty of Medicine, Department of Anatomy/Bursa, Turkey*
[3] *Bursa Uludag University, Faculty of Medicine, Department of Biostatistics/Bursa, Turkey*
[4] *Bursa Uludag University, Faculty of Medicine, Department of Anatomy/Bursa, Turkey*
[5] *Bursa Uludag University, Faculty of Medicine, Department of Biostatistics/Bursa, Turkey*
[6] *Bursa Uludag University, Faculty of Medicine, Department of Anatomy/Bursa, Turkey*
[*] *Corresponding author.*
[♯] *602410001@ogr.uludag.edu.tr*

Objective: This study aims to evaluate the perceptions of physical therapy and rehabilitation (PTR) students toward anatomy education and to demonstrate how the curriculum can be optimized according to professional requirements by decoupling it from traditional medical education models.

Methods and Materials: A total of 179 undergraduate students participated in this cross-sectional study. Data were collected using a structured 42-item questionnaire designed to measure educational experiences, digital integration, and perceptions regarding clinical application.

Results: Although 93.8% of PTR students identified anatomy as the most critical professional course, 73.2% reported difficulties in comprehending muscle *origo* and *insertio* points. Senior students experienced significant challenges in correlating anatomical knowledge with clinical cases ($p < 0.05$). While students found traditional models insufficient for topographic anatomy (40.3%), they strongly emphasized the necessity of 3D animations (87.2%) and artificial intelligence integration (62.6%). Furthermore, 84.4% of participants advocated for a topographic anatomy curriculum specifically tailored to the PTR discipline.

Conclusion: To maximize the clinical decision-making competencies of future physiotherapists, the anatomy curriculum must be urgently decoupled from the medical faculty model. A standalone "core anatomy curriculum" should be developed, centered on superficial and topographic anatomy, supported by digital technologies, and specifically tailored to PTR professional requirements.

Keywords: curriculum, anatomy, physiotherapy

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

Disclosure statement: The authors declare no conflict of interest.

References:

1. Alper Vatansever, Emrah Özcan Tıp Fakültesi Dönem 1 ve Dönem 2 Öğrencilerinin Anatomi Pratik Eğitimini Değerlendirmeleri Uludağ Üniversitesi Tıp Fakültesi Dergisi 44 (2) 125-128, 2018
2. Tuygar ŞF, Kuş İ, Saygılı ÖK, Özcan E, Gülcen B. Tıp fakültesi öğrencilerinin anatomi eğitimine yönelik memnuniyet düzeyleri ve ilgili değişkenlerin değerlendirilmesi. Tıp Eğitimi Dünyası, 2015;42.
3. Babacan, Serdar, Nilgün Tuncel Çini, İlker Mustafa Kafa, and Okan Aydın. 2021. "Vertical Integration of Anatomy Curriculum in the Undergraduate Clinical Education Period: Medical Students' Perspectives". *Anatomy* 15 (3): 247 51.
4. Bolatlı, Güneş. "Hemşirelik bölümü öğrencilerinin anatomi dersi hakkındaki düşünceleri." *Sürekli Tıp Eğitimi Dergisi* 30.4 (2021): 238-244.
5. Öğetürk M, Kavaklı A, Kuş İ, Songur A, Zararsız İ,Sarsılmaz M. Tıp Öğrencileri Nasıl Bir Anatomi Eğitimi İstiyor? Tıp Eğitimi Dünyası. 2003; 10(10).
6. Karul, Aslıhan Büyüköztürk, et al. "Sağlık bilimleri lisans eğitiminde anatomi dersi kapsamında anatomik maketlerin kullanımının öğrencilerin akademik başarıları üzerine etkisi." *Adnan Menderes Üniversitesi Sağlık Bilimleri Fakültesi Dergisi*6.2 (2022): 303-309.
7. Demir, M., Atay, E., Kılıç, M., İpekçi, N. (2014). Kilis 7 Aralık Üniversitesi lisans ve önlisans eğitiminde öğrencilerin anatomi dersi ile ilgili görüşlerinin karşılaştırılması. *Sağlık Bilimleri Dergisi, 23,* 144-148.
8. Taner D,(eds). Fonksiyonel anatomi: Ekstremiteler ve sırtbölgesi. 7. Baskı. Ankara: HYB Yayıncılık; 2013.
9. Yavuz F, Ertekin T, Elmalı F, Ülger H. Klinik öncesi ve klinik dönemde tıp öğrencilerinin anatomi eğitiminde kadavra kullanımı ile ilgili değerlendirmeleri. Erciyes Üniversitesi Sağlık Bilimleri Dergisi. 2017;26:227-32.
10. Carmichael SW, Pawlina W. Animated powerpoint as a tool toteach anatomy. Anatomical Record. 2000;26:83-8.
11. ÇAN, Mehmet Ali. "Trakya University Medical Anatomi Eğitimi Alan Tıp Fakültesi ve Diş Hekimliği Fakültesi Öğrencilerinin Anatomi Dersine Yönelik Metaforları Metaphors for Anatomy Lesson of Students Who Received Anatomy Education in Faculty of Medicine and Faculty of Dentistry."
12. Çiftcioğlu, Engin, Zeynep Altuntaş, and Ezgi Çiftcioğlu. "Geçmişten Geleceğe Anatomi Eğitimi." *Black Sea Journal of Health Science* 5.3 (2022): 600-605.
13. Simons, Ashley C. ve diğerleri. "Öğretimsel yaklaşımlar: fizyoterapistlerin anatomi eğitimi." *Anatomik bilimler eğitimi* 15.1 (2022): 102-114.
14. Gürses, H. Nilgün, et al. "Türk Fizyoterapi ve Rehabilitasyon Dergisi." *Turk J Physiother Rehabil* 25.1 (2014): 16-27.
15. World Confederation For Physical Therapy [http://www.wcpt.org] London: What is physical therapy [Internet]. 2014 [cited 26 March 2014]. Available from: http://www.wcpt.org/what-is-phy-sical-therapy.
16. World Health Organisation [http://www.who.org]. Geneva: Clas-sifying health workers: mapping occupations to the international standard classification, Adapted from International Labour Organization, International Standard Classification of Occupati-ons: ISCO-08 [Internet]. 2013 [cited 23 September 2013].
17. John CM, John B, Paul B, Judy S. Teaching anatomy without cadavers. Med Educ. 2004;38(4):418-24.
18. Johnston, A. N. (2010). Anatomy for nurses: proving students with the best learning experience. *Nurse Educ. Pract. 10,* 222e226.
19. Akbaba, Ö., Tercan, B., Tarsuslu, S., Yurt, S. U. (2020). İlk ve acil yardım laboratuvarında uygulanan simülasyon eğitiminin öğrencilerin temel beceri düzeyine etkisi. *Journal of Health Services and Education, 3(2)*, 45-51.
20. A call for improving of musculoskeletal education on physical medicine and rehabilitation studies: a systematic review with meta-analysis Ying Jin [1], Liqian Ma [2], Jie Zhou [2], Bing Xiong [3], Asanga Fernando [4], Huon Snelgrove [4]Affiliations expand
21. Higgs J, Hunt A, Higgs C, Neubauer D. Physiotherapy education in the changing international healthcare and educational contexts. Adv Physiother. 1999;1(1):17-26.
22. Broberg C, Aars M, Beckmann K, Emaus N, Lehto P, Lahteenmaki MJ, et al. A conceptual framework for curriculum design in physiotherapy education-An international perspective. Adv Physiother. 2003;5(4):161-8.
23. Akınoğlu, Bihter, Zeynep Arıkan, and Fatma Büşra Bengüboz. "Türkiye'de Fizyoterapi Ve Rehabilitasyon Alaninda, Öğrenci, Akademisyen Ve Klinisyen Bakiş Açisiyla Kanita Dayali Uygulamanin Yeri: Pilot Çalişma." Türk Fizyoterapi ve Rehabilitasyon Dergisi 36.2 (2025): 194-202.
24. Alshehri MA, Alalawi A, Alhasan H, Stokes E. Physiotherapists' behaviour, attitudes, awareness, knowledge and barriers in relation to evidence-based practice implementation in Saudi Arabia: a cross-sectional study. Int J Evid Based Healthc. 2017;15(3):127-41.
25. Scurlock-Evans L, Upton P, Upton D. Evidence-based practice in physiotherapy: a systematic review of barriers, enablers and interventions Physiotherapy. 2014;100(3):208-19.
26. Simons, Ashley C. ve diğerleri. "Öğretimsel yaklaşımlar: fizyoterapistlerin anatomi eğitimi." *Anatomik bilimler eğitimi* 15.1 (2022): 102-114.
27. McMeeken J, Webb G, Krause KL, Grant R, Garnett R. Learning outcomes and curriculum development in Australian physiotherapy education. Melbourne: The University of Melbourne. 2005.
28. Commission on accreditation in physical therapy education (CAPTE). Position papers: accreditation handbook, April 2013. [updated 20 May 2013; cited 26 March 2014].
29. Commission on accrediation in physical therapy education (CAPTE). Evaluative criteria pt programs, November 2013. [updated 27 February 2014; cited 26 March 2014].
30. CCPUP, Entry-to-Practice Physiotherapy Curriculum: A Companion Document: Clinical Education Guidelines for CanadianUniversity Programs The Canadian Council of Physiotherapy University Programs. 2014
31. A core musculoskeletal anatomy syllabus for undergraduate physical therapy student education Stephanie J. Woodley, Rodney A. Green, Alexandra L. Webb Clinical Anatomy Cilt36, Sayı2, Sf. 190-223
32. Çamlı, Fatma Mutlu, Hilal Irmak Sapmaz, and Abdulkerim Kasap. "Anatomi eğitimi hakkında Tıp Fakültesi ve Sağlık Bilimleri Fakültesi öğrenci görüşlerinin değerlendirilmesi." *International Journal of Tokat Medical Sciences* 16.2 (2024): 57-63

https://doi.org/10.1016/j.aanat.2026.152969