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## Genetic approach to orthodontic external root resorption

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External apical root resorption (EARR) is one of the most frequent iatrogenic effects of orthodontic treatment, resulting in loss of the dental structure of the root apex that mainly affects the maxillary incisors. EARR was first reported by Ottolenghi in 1914 as a complication of orthodontic treatment. The first comprehensive study on EARR was made by Ketcham in 1927. Harris et al. reported the hypothesis of genetic influence on EARR using the sib-pair model with high heritability about 70% in 1977.

Al-Qawasmi et al who investigated the relationship between the polymorphism in interleukin IL-1 (IL-1A and IL-1B) genes and external apical root resorption, stated that the force applied by orthodontic treatment alone or the appliance type was not responsible for root resorption.

Another candidate gene for orthodontic forces-induced root resorption is tissue non-specific alkaline phosphatase (TNSALP), which encodes a protein that has an important function in the cement formation and root mineralization process.

Following studies in this area also show that it is essential to develop a robust and well-structured genetic predisposition database that can be used in orthodontic practice to ensure that 'high-risk' individuals are identified based on their genetic information before initiating orthodontic treatment.

### Recent publications

1. Hartsfield JK Jr, Everett ET, AL-Qawasmi RA. Genetic factors in external apical root resorption and orthodontic treatment. Crit Rev Oral Biol Med 2004;15:115–122.
2. Ottolenghi R. The physiological and pathological resorption of tooth roots. Dent. Items Int. 1914;36:332–355.
3. Ketcham AH. A preliminary report of an investigation of apical root resorption of permanent teeth. Int J Orthod Oral Surg Radiograph 1927;13:97-127.

### Biography

She graduated from Vefa High School in 2008. She completed her undergraduate education at Istanbul university faculty of Dentistry in 2015. Later, she increased her clinical experience in general dentistry. She started associate degree education in Anadolu University Open education faculty management of Healthcare organizations and finished in 2022. In 2021, she started her doctorate education at Izmir Katip Celebi University, Institute of Health Sciences, Department of Orthodontics.

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