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Biography

Uri Zilberman, is a distinguished medical professional based in Ashkelon, Israel. He is affiliated with the Barzilai Medical University Center in Ashkelon, which is associated with Ben Gurion University of the Negev, Beer-Sheva. With a commitment to advancing medical education and health-care, Dr. Zilberman plays a vital role in clinical and academic activities within his institution.

Single Root Molars: Prevalence and Its Significance in Human Evolution

Abstract:

Background and Aim: Anatomic variation in root morphology of permanent molars that have been reported pertain to the presence of additional roots, canals or fused roots and C-shaped canals. The occurrence of a single root in molars (SRM) is rare. The aim of the study was to determine the prevalence of single root molar in a large sample of Israeli population and to correlate the crown size of SRM to dental evolution of HSS.

Methods: 2425 panoramic radiographs of modern healthy patients were examined on a light table and the prevalence of SRM was determined. The crown width (MD) of the mandibular second molars of normal two rooted molars, single root molars and homologue two-rooted molars were measured using a digital caliber on a light table. The results of the crown width were compared to anthropological populations (Early HSS and Neanderthals) and archeological population from excavations in Israel from 5000 BC to 13-19 century AC.

Results: The prevalence of single root molars in the modern population was 6.13%. No significant differences were found between males and females. In the upper jaw single root molar was found in both first and second molars while in the lower jaw only second molars showed SRM. In both the Neanderthal and Early HSS groups 1 case with single root molars was found. No single root molars was found in the archeological groups from Israel excavations (5000 years BC till 19th century AC). Graph 1 shows the changes in MD crown width during evolution of HSS. We can see that the size of the crown was relatively stable during evolution but during the modern period the MD size of the crown was significantly reduced. Graph 2 shows the distribution of the MD crown width of mandibular second molars in the modern population in comparison with single root molars and homologue two-rooted molars. The crowns of the molars with single root showed significant reduction in comparison to two-rooted molars and the differences are significant statistically (P value <0.01). The homologue two-rooted second molars showed results between the normal population and single root molars.

Discussion: This is the first analysis of the prevalence of single root molar in a large population of Israel. The prevalence of single root molars was 6.13%. During the evolution of HSS from 120K years BC to the 19th century AD the crown size was more or less stable. Significant differences were found in the MD crown dimensions between the early population (early HSS and Neanderthals) and archeological periods (5000 BC to 1900 AC) and the modern population. The MD crown width of single root molars was significantly reduced in comparison with two-rooted modern population and in the homologue two-rooted molars the crown width was smaller than the modern but larger than the single root molars. The results showed that the crown size is decreasing during the modern period and this reduction is increasing in single root molars, implicating that an on-going reduction in tooth size is happening, probably due to reduction of jaw size and the changes in food processing. More than that, single root molars are associated with higher percentages of impacted upper canines (9.9% VS 4% in the general population).

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