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ORIGINAL ARTICLE

Shovel-shaped incisors in the Black Sea region population of Turkey

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Abstract *Background/purpose:* Shovel-shaped incisors are teeth with thick marginal ridges surrounding a deep lingual fossa. They have a higher prevalance in Asian racial groups. In this study, we aimed to find the incidence of shovel shaped incisors in Turkish population, distribution of them according to teeth and sex, and to show the relationship between SSI and the other morphological changes.
Materials and methods: The study was carried out on 3960 women and men. Shovel-shaped incisors were detected on 437 individuals. Photographic images of the palatinal surfaces were obtained and after the examiantion of high resolution digitalized images by two observers, teeth of 400 individuals were diagnosed as shovel-shaped. Teeth were classified as "Trace shovel" (type I), "semi shovel" (type II), and "shovel-shaped" (type III) according to the Hrdlicka's scale. the results were analyzed with Chi-square (χ^2) test.
Results: Prevalence was 10.1%. Shovel-shaped incisors were found in both central incisors and lateral incisors of 273 individuals (68.5%), solely in lateral incisors of 119 individuals (29.5%), and in both maxillary central and lateral incisors and canines of 8 individuals (2%). Shovel-shaped incisors were present in the teeth of 228 women and in the teeth of 172 men ($P = 0.015$). The majority of the inisors were showing Type II severity (in the central-lateral incisor group 127 individuals, in the lateral group 71 individuals ($P = 0.013$). Thirty-four accompanied dental anomalies were dens in dente, Talon cusp, peg-shaped laterals, microdonty, and cingulum hypertrophy was 34. Dens in dente constituted the majority ($n = 23$, ratio = 67.6%).

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Conclusion: The incidence of shovel-shaped incisors was 10.1% in our study group; SSI affected lateral incisors more than central incisors; the number of women reflecting SSI was higher than men; and the majority of individuals had Type II (semi-shovel) severity.

Introduction

Shovel-shaped incisors (SSIs) are characterized by a pronounced hollow area on the palatinal surface of the teeth surrounded with a well-defined elevated enamel border. Because this condition resembles an ordinary coal shovel, teeth with that extraordinary condition are termed "shovel-shaped incisors". The affected incisors demonstrate a hollowed lingual surface bounded with pronounced lateral margins, thus resembling the scoop of a shovel.[1]

SSI is more prevalent in maxillary incisor teeth than mandibular incisors teeth and is more commonly involved in maxillary lateral incisors than the central incisors. No sex predominance was reported.[1–5]

SSIs have dental characteristics that are described as "Sinodonty" or "Sundadonty". The difference between the two terms is geographical. While "Sino" is used to describe mainland China, Mongolia, and Eastern Siberia, "Sundo" refers to the population living in south of those areas. SSI is predominant in Asians, Asian-derived populations, and Native Americans and is rare or absent in African and European populations. This anomaly is a polygenic inheritable trait and has received much attention from anthropologists because it plays an indicator role in determining the relations of populations.[1,6–8]

This condition, which was later termed "shovel-shaped", was first observed in American Indians. Further studies showed frequent occurrence of SSI in various yellow-brown populations, such as Malays, Mongolians, Chinese, and Japanese.[2]

The detection of SSI during routine clinical examination and the lack of studies on SSI in Turkey attracted our attention. The aim of this study is to find the incidence of SSI in Turkish population, distribution of SSI according to teeth and sex, and to show the relationship between SSI and morphological changes.

Materials and methods

The study group consisted of 3960 patients who attended the Ondokuz Mayis University School of Dentistry Department of Oral and Maxillofacial Radiology between 2010 and 2011. Only volunteers were included, and their written approvals were obtained.

Patients with missing maxillary incisor(s), lateral and canine teeth, or teeth with restorations on crowns were excluded. In 437 patients, SSI was detected visually on the palatinal surfaces of the maxillary central and lateral incisors and canines, and digital photographic images of the palatinal surfaces of the teeth were obtained. The digital images were then recorded in a computer. The images were inspected under 2× magnification by two observers at two times. When no consensus was reached between two observers, the doubtful images were excluded. Finally, 400 individuals were enroll in the study, and their teeth were classified as "Type I" (trace shovel; Fig. 1), "Type II" (semi-shovel; Fig. 2), and "Type III" (shovel-shaped; Fig. 3) according to the Hrdlicka's subjective scale.

A Chi-square (χ^2) analysis was applied to determine whether or not the shovel-shaped incisors statistically depend on location and sex and to ascertain the relationship between SSI and morphological alterations. Depending on the contingency coefficients (%), contingency tables were calculated to determine the degree of association between SSI and the parameters listed above. The level of significance was set as $P < 0.05$. (SPSS version 10.0; SSPS Inc., Chicago, IL, USA).

Results

This study was carried out on a Turkish population of approximately 3960 individuals. Shovel-shaped incisors (SSI) were detected in 400 individuals, of which, 228 were women and 172 were men. The ages ranged from 10 years to 73 years (average: 28.14 years).

The prevalence of SSI was found as 10.1%. The SSI prevalence of women (5.75%) was higher than the prevalence of men (4.35%). Moreover, all teeth detected with SSI were bilateral.

In 273 individuals (68.5%), SSI was found in both maxillary central incisors and lateral incisors (UI1 + UI2). In 119 individuals (29.5%), SSI was found solely in maxillary lateral incisors (UI2), and in only eight individuals (2%), it was found in both maxillary central and lateral incisors and canines (UI1 + UI2 + UC).

An analysis of the relationship between teeth with SSI and sex revealed that teeth were dependent on sex

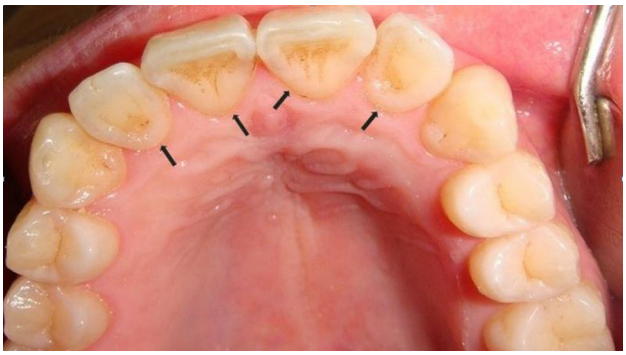

Figure 1 Type I shovel-shaped incisor: Trace shovel. Arrows indicate distinct traces of enamel rim at the palatal surface of maxillary central incisor, and lateral incisor teeth.