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**Araştırma/ Research Article**

# PREVALENCE OF PITUITARY CALCIFICATIONS USING CONE BEAM COMPUTED TOMOGRAPHY IN TURKISH SUBPOPULATION

# KONİK IŞINLI BİLGİSAYARLI TOMOGRAFİ İLE DEĞERLENDİRİLEN HİPOFİZ KALSİFİKASYONLARININ TÜRK SUBPOPÜLASYONUNDAKİ SIKLIĞI

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**ABSTRACT**

**Purpose:** The objective of this study was to investigate the prevalence of pituitary calcifications using cone beam computed tomography in a group of Turkish individuals.
**Material and methods:** Cone beam computed tomography scans in the axial, coronal and sagittal planes of the pituitary gland of 284 patients were examined for evidence of pituitary calcification.
**Results:** In the cone beam computed tomography scans, pituitary calcifications were seen 0.7% of the sample. All of the pituitary calcifications were observed in males.
**Conclusion:** This study showed a low frequency of pituitary calcification. Thus, the low percentage should be considered in the differential diagnosis of calcifying tumors in the sella region and during pre-surgical planning related to the pituitary gland.
**Key Words:** Pituitary gland, calcification, cone beam computed tomography

**ÖZET**

**Amaç:** Bu çalışmanın amacı konik ışınlı bilgisayarlı tomografi ile hipofiz kalsifikasyonlarının Türk subpopülasyonundaki sıklığını araştırmaktır.
**Gereç ve Yöntem:** 284 hastanın hipofiz bezine ait aksiyel, koronal ve sagittal düzlemde konik ışınlı bilgisayarlı tomografi ile yapılan taramaları, pituiter kalsifikasyonların varlığı açısından incelendi.
**Bulgular:** Konik ışınlı bilgisayarlı tomografi ile yapılan taramalarda pituiter kalsifikasyonlar % 0.7 oranında görüldü. Pituiter kalsifikasyonların tümü erkeklerde gözlendi.
**Sonuç:** Bu çalışmada hipofiz kalsifikasyona ait düşük bir oran bulundu. Bu düşük oran sella bölgesindeki kalsifiye olan tümörlerin ayırıcı tanısında ve pituiter bezle ilgili cerrahi öncesi planlamada dikkate alınmalıdır.
**Anahtar Kelimeler:** Hipofiz bezi, kalsifikasyon, konik ışınlı bilgisayarlı tomografi

## INTRODUCTION

In the pituitary region, several types of sellar - suprasellar lesions may present. In these lesions, non-pituitary origins of sellar - presellar lesions are less commonly seen.[1,2] In pituitary lesions, the most common are pituitary adenomas.[3-5] Pituitary adenomas do not calcify frequency. [6,7] The most common sellar - suprasellar lesion with calcification is craniopharyngioma.[3,4] Generally, nodular, curvilinear and mixed are the various from of calcification seen in a sellar - suprasellar location.[3,8-11] Preoperative differential diagnosis in the pituitary region is extensive.[12] The preoperative differential diagnosis is important and presence or absence and type of calcification pattern can be helpful for distinction between these pathologies.[3,13] Skull radiography can be used for the diagnosis of the calcification.[8] However, magnetic resonance imaging (MRI) is the imaging modality of choice for the evaluation of the sellar and parasellar regions, as it offers more information on pituitary morphology and surrounding structures.[1,14-16] However, there are specific situations

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in which a computed tomography (CT) scan may be of use, such as for detection of calcification.[1,15,16] or obtaining detailed information regarding bone anatomy.[1,16] Cone beam computed tomography (CBCT) is relatively a new three-dimensional imaging technique that uses a cone beam that moves around the part of the body under examination and uses generally in dental implantology. In the literature search, there is no study investigating the prevalence of the pituitary calcifications in Turkish individuals.

The aim of this study was to investigate the prevalence of pituitary calcifications using dental volumetric tomography in a group of Turkish induviduals.

## PATIENTS AND METHODS

We designed a retrospective study consisting of images of 284 patients (172 male, 112 female) who visited our clinic between January 2011 and January 2012. Their ages ranged from 20 to 60 years, with mean age of 43 years ± 11 years. CBCT scanning (NewTom 3G; Quantitative Radiology S.R.L., Verona, Italy) was done on supine position; the patient's head was adjusted in such a way that hard palate was parallel to the floor while the sagittal plane was perpendicular o the floor. The CBCT scans with 0.2 mm slices in the axial planes, 1 mm slices in sagittal planes and 1 mm slices in coronal planes were obtained. Imaging parameters were kV, 110; mA, 15; and FOV, 130 mm. The output was automatically adjusted during a 3600 rotation according to tissue density (automatic exposure control system). The CBCT images were evaluated with respect to the pituitary calcification. The axial images were as initial images and were used for chosen identification of presence of the pituitary calcifications. Images were viewed in a darkened room on computers with 17-inch LCD monitors (Samsung, Seoul, South Korea) with the same screen resolution by an oral and maxillofacial radiologist.

## RESULTS

The incidence of the pituitary calcification was 0.7%. The entire pituitary calcifications were observed in males (Figures 1 and 2).

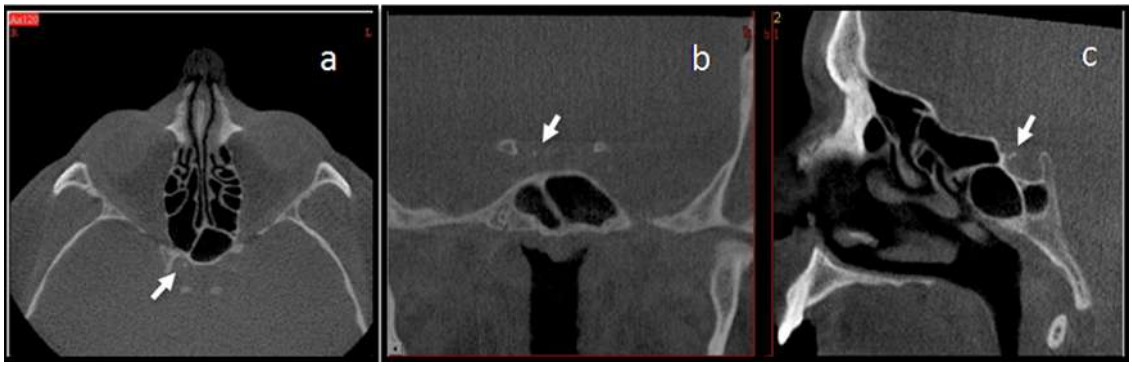


Figure 1.

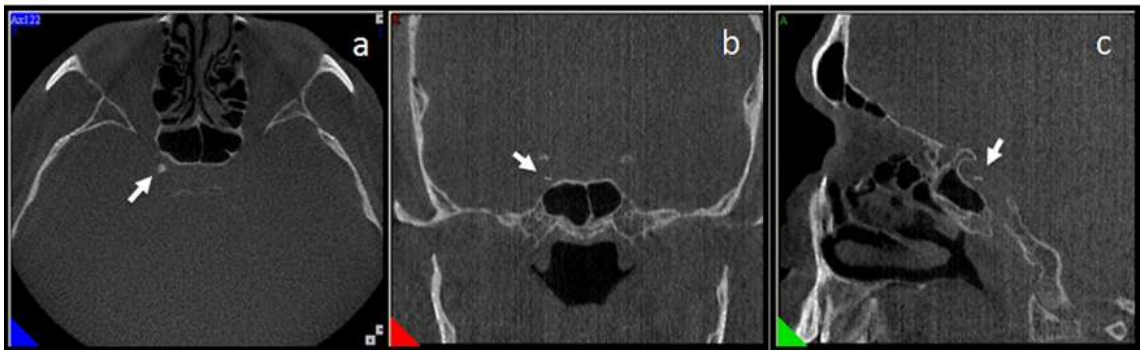


Figure 2.

Figure 1, 2. CBCT images of the pituitary calcifications (arrows); axial (a), coronal (b), sagittal (c) images

**DISCUSSION**

Non-contrast-enhanced CT of the head is the preferred imaging modality worldwide for the initial evaluation of patient with acute or chronic neurological problems, so calcification seen on CT are the most common finding in the neuroradiology.[6] Some pathologic conditions involving the pituitary gland are associated with calcification and the recognition of their appearance and distribution helps the differential diagnosis. In addition, in asymptomatic patient with calcification, early detection of these diseases reduces the morbidity and mortality.[6] To our knowledge, this is the first study regarding the pituitary calcifications in Turkish individuals. In the literature, there is no study regarding the prevalence of the pituitary calcifications for ethnic populations so it has not been possible to undertake a meta-analysis. However, presence of calcifications has been reported by some studies regarding the pituitary mass.[3,8,17] In these study, it is stated that the calcifications can occur rarely in cases of pituitary adenomas and Rathke's cleft cysts [3,11,13] and craniopharyngioma is the most common sellar - suprasellar lesion with calcification.[4] Calcification in pituitary adenoma is detected radiographycally in 0.2% to 14.0% cases.[8,18-20] However, there is no data regarding sex in these studies. In our study, we found the pituitary calcification in male patients by using CBCT. Over the past decade, CBCT has been designed for imaging hard tissue of the maxillofacial region and uses commonly in dental implantology.[21,22]

In conclusion, this study showed a low frequency of the pituitary calcifications. Thus, the low percentage should be considered in the differential diagnosis of calcifying tumors in the sellar region and during pre-surgical planning related to the pituitary gland. In addition, CBCT may be used as a diagnostic tool to investigate the pituitary calcifications.

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