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Calcifications in Neck Region: an Insight

Boyun Bölgesi Kalsifikasyonu: İçyüzü

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ABSTRACT

Neck region often presents with a complexity in wide variety of anatomical structures. It is important for the clinician to accurately identify the normal anatomical structures, anatomic variants and hence forthe an accurate diagnosis of the pathological state can be achieved upon. This article enlists and explains the possible radiopaque structures senn in neck region which can be missed out and which can be a potentially dangerous condition on a later date if left unnoticed.

Key words: Phlebolilths, Triticeouscartilage, Tonsilolith.

ÖZET

Boyun bölgesi anatomik yapı açısından geniş çeşitlilikte kompleksite gösterir. Anatomik varyantlar arasından kesin olarak tanımlanmış normal anatomik yapı klinisyenler açısından önemlidir. Bu yüzden patolojik durumun teşhisi için bu tip bilgilere erişilebilinmelidir. Bu makale, boyun bölgesinde gözden kaçabilen ve eğer fark edilmemiş ise ileride tehlike teşkil edebilecek muhtemel Radyopak yapıları listelenmesini ve açıklamasını içeriyor.

Anahtar kelimeler: Flebolit, Tritisöz kıkırdak, tonsillolit (Tonsil taşı)

INTRODUCTION:

Physiologic and pathologic calcifications in the face and neck usually do not play a major role during the evaluation and diagnosis of diseases in the face and neck. But Clinical studies have shown that calcifications of the soft face and neck tissues may occur in several mostly benign processes such as hemangioma, lateral cleft cysts, unspecific inflammations, or lymph nodes[1].

CALCIFICATIONS IN NECK REGION

1. Lymph Node calcifications.
2. Salivary gland calcifications.
3. Carotid artery calcifications.
4. Phleboliths
5. Styloid ossifications
6. TriticiousCartillages
7. Tonsilloliths

Lymph Node Calcifications

Calcified cervical lymph nodes are uncommon, but when they are identified, the most common etiologies include infection, inflammation and malignancy[2]. Nodal calcifications in the neck region are uncommon, only occurring in about 1% of enlarged nodes[3].

The main differential diagnoses are foreign body, calcified lymph nodes, calcified parotid gland stones, tuberculous lymph nodes, calcified vascular lesions, haemangiomas, lymphangiomas, or

as atherosclerotic plaques inside the major blood vessels, myositis ossificans and, finally, metastasis from distinct calcifying neoplasm.

One of the most frequent misleading clinical states, calcified lymph node, will present as a non-painful swelling (without any "mealtime syndrome"), or as a randomly revealed radiopaque lesion in the maxillofacial region, usually after tuberculotic infection[4].

Phleboliths are calcified thrombi occurring in venules, veins or haemangiomas. Their formation is thought to be as a result of vascular anomaly, which induces thrombus formation. The end result is calcium deposit with eventual stone formation. [5]

Salivary Gland Calcifications

Various types of congenital/developmental cysts are lymphoepithelial cysts, BCCs, epidermoid cysts, polycystic disease, congenital sialectasis, and Merkel's cyst. Acquired cysts are sialocysts, pneumoceles, AIDS-related parotid cysts, ranula, and cystic tumors of the salivary gland[6]. Sialocysts are acquired cysts, which occur as a result obstruction of the duct due to inflammation, calculus, trauma, postsurgical complication, or a mass. These are true cysts with epithelial linings. Patients most commonly present in the fifth decade and the most common site is the sub-mandibular gland. Needle aspiration of saliva from the cyst confirms diagnosis. Cystic tumors of salivary gland: Low-grade mucoepidermoid carcinoma, papillary-cystic variant of acinic cell carcinoma, and papillary adenocarcinoma are the three low-grade lesions that may present as cystic tumors most commonly affecting the parotid gland[6].

Carotid artery calcifications:

Cardiovascular disease affects the heart and arteries with disorders such as heart attack, stroke, arrhythmia, ischemia, and angina. The main characteristic of cardiovascular disease is the presence of atherosclerosis.

The risk factors include age, cholesterol levels, triglyceride levels, diabetes, hypertension, smoking, and obesity. The causes of atherosclerosis might be genetic in origin; however, the major cause is the accumulated effects of obesity, a sedentary lifestyle, smoking, hypertension, a high-cholesterol diet, and excessive alcohol consumption[7].

Phleboliths

The formation of phleboliths typically causes no symptoms. Phleboliths consist of a mixture of calcium carbonate and calcium phosphate salts and are thought to form when a fibrous component attaches to a developing phlebolith and becomes calcified. Radiologically, they have either a radiolucent or a radiopaque core, and repetition of this calcification causes an onion-like appearance or concentric rings. In the maxillofacial region, they are usually multiple and vary in size[8].

The differential diagnosis of phleboliths includes other causes of calcifications in the head and neck area, such as sialolithiasis, tonsiloliths, healed acne lesions, cysticercosis, miliary skin osteomas,[7] calcified lymph nodes, and carotid artery calcifications[9].

Plain radiographs can show soft tissue calcifications. The presence of round, smooth, and laminated phleboliths is pathognomonic for a cavernous hemangioma. Palpation of small hard nodules deep within the muscle that are diffuse and compressible should alert the clinician to the possibility of phleboliths. Plain soft tissue X-ray image can show phleboliths, and nonionizing techniques, such as ultrasound and Magnetic Resonance I maging, can provide useful information to clinicians about the location of calcifications and the extent of the lesion.

Phleboliths associated with vascular anomalies were initially found in the splenic vein by Canstatt in 1843 and in the maxillofacial region by Kirmission in 1905. According to Ribbert's theory phlebolith formation begins with intravascular thrombus formation and is followed by progressive

lamellar fibrosis. Calcium phosphate and calcium carbonate are deposited at the center of the thrombus, with an extension of mineralization to the periphery. Microscopically phleboliths consist of calculi with characteristic concentric lamination[10].

Styloid Ossifications:

According to Liu, Wang, Zhang et al. (2005), the styloid process elongation seems to be more common among women; Rizzatti-Barbosa, Ribeiro, Silva-Concilio et al. (2005) add that this is due to menopause[11].

The etiology has been described by several authors, including Eagle (1937), suggesting that it is a result from a previous trauma. According to Gokce, Sisman and Sipahioglu (2008), liver disorders can lead to a change in the metabolism of calcium, phosphorus, and vitamin D predisposing to calcium deposition and ossification of the ligaments. On the other hand, Piagkou, Anagnostopoulou, Kouladouros et al. (2009) reported that the etiology can be explained by a genetic alteration or according to three different theories. The first theory, the hyperplastic reaction, suggests that the styloid process had been stimulated by a pharyngeal trauma leading to the ossification of the styloid ligament. The second theory, metaplastic reaction, also includes a traumatic stimulus causing multiples metaplastic alterations in the cells of the styloid ligament, which results in its total or partial ossification. The third theory, anatomic variation, suggests that the styloid process and the styloid ligament are not usually ossified, but rather, an anatomic variation.

Correll, Jesen, Taylor et al. (1979) investigated 1771 radiographies and estimated the incidence to be 18.2, 93% of which exhibited bilateral elongation. The ossification of the styloid-stylo mandibular ligament in the styloid process was found in 30% of a total of 1135 patients investigated by Keur, Campbell, McCarthy et al. (1986) corroborating the general consensus in the literature that this is a common radiographic finding. Nevertheless, Rossi, Freire, Prado et al. (2009) found that the ossification of the styloid ligament is not uncommon.

Triticeous Cartillages:

Calcification of the triticeous cartilage occurs in 29% of men and 22% of women.[12] Many professionals confuse calcification in the triticeous cartilage with atheromas,mainly because it is localized in the interior of theaeropharyngeal space, next to the upper portion of theC4 vertebra. There are very consistent reasons forthe confusion when one considers that the calcified atheromas of the carotid are observed as nodular radiopaque masses adjacent to the C3 and C4 vertebrae[13]. However, Carter et al.[14] in 1997 and Carter1 in 2000 warn that calcified atheromas of the carotid artery appear more laterally in panoramic radiographs than the calcified triticeous cartilage.

The hyoid bone was the second most indicated structure by the examiners, after the triticeous cartilage. This finding can be explained by the proximity of the 2 anatomic locations. According to Friedlander[15] the body of the hyoid bone is found inferiorly to the base of the angle of the mandible.

Tonsiloliths

Tonsilolith or tonsil stone are unusual presentation of stones in the tonsillar crypts. They may occur with various etiology connected with salivary gland, oral cavity and metabolic disturbances. The most common complication with tonsilolith includes halitosis (bad breath), dysphagia, choking, tonsillar and ear diseases. The differential diagnosis of tonsilolith include chronic tonsillitis, peritonsillar abscess, tonsillar hypertrophy, foreign bodies like phlebolites, ectopic cartilage or bone, lymph nodes, submucosal lipoma, granulomatous lesions

CONCLUSION

Calcifications in neck region can present a potential challenging scenario for the oral

diagnostitian. It is important to distinct between the normal radiopaque and radiolucent structures present in the neck region with that of the pathological condition for arriving at the appropriate management protocol and henceforth a better prognosis for the patient can be achieved reducing the errors in the diagnosis.

REFERENCES

1. Keberle M and Robinson S. Physiologic and pathologic calcifications and ossifications in the face and neck. EurRadiol2007;17:2103-11.
2. Eisenkraft BL and Som PM. The spectrum of benign and malignant etiologies of cervical node calcification. Am J Roentgenol 1999; 172:1433-7.
3. Som PM and Brandwein MS. Lymph nodes. Head and neck imaging. In: Som PM, Curtin HD, editors. St. Louis: Mosby;2003. pp. 1865-1934.
4. Bar T and Zagury A. Calcifications simulating sialolithiasis of the major salivary glands. DentomaxillofacialRadiol 2007;36:59-62.
5. Hessel AC, Vora N, Kountakis SE. Vascular lession of the masseter presenting with phlebo lith. Otolaryngol Head Neck Surg 1999;120:545-8.
6. Som P, Curtin HD. Head and Neck Imaging. 4th ed. St. Louis, MO:Mosby; 2002. p. 2006 133.
7. Fensterseifer DM, Karohl C, Schvartzman P, Costa CA, Veronese FJ. Coronary calcification and its association with mortality in haemodialysis patients. Nephrology. 2009;14:164-70.
8. Altug HA, Büyüksoy V, Okçu KM, Dogan N, Peleg L, Eli I. Hemangiomas of the head and neck with phleboliths: clinical features, diagnostic imaging, and treatment of 3 cases. Oral Surg Oral Med Oral Pathol Oral RadiolEndod 2007;103:60-4.
9. Mandel L, Perrino MA. Phleboliths and the vascular maxillofacial lesion. J Oral MaxillofacSurg 2010;68:1973-6.
10. Scolozzi, P., Laurent, F., Lombardi, T., Richter, M., 2003. Intraoral venous malformation presenting with multiple phleboliths. Oral Surg. Oral Med. Oral Pathol.Oral Radiol. Endod. 96 (2), 197–200.
11. LIU, S., WANG, Y., ZHANG, R., LIU, S. and PENG, H. Diagnosis and treatment of 23 cases with stylohyoid syndrome. Shanghai Kou Qiang Yi Xue, 2005, vol. 14, p. 223-6.
12. Hately W, Evison G, Samuel E. The pattern of ossification in the laryngeal cartilages: a radiological study. Brit J Radiol 1965;38:585-91.
13. Lewis DA, Brooks SL. Carotid artery calcification in a general population: a retrospective study of panoramic radiographs. Gen Dent 1999;47:98-103.
14. Carter LC, Haller AD, Nadarajah V, Calamel AD, Aguirre A. Use of panoramic radiography among an ambulatory dental population to detect patients at risk of stroke.J Am Dent Assoc 1997;128:977-84.
15. Friedlander AH. Panoramic radiography: the differential diagnosis of carotid artery atheromas. Spec Care Dent 1995;15:223-7.

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