

Use of Contrast Radiography to Differentiate Unilocular Cystic Lesion from Multilocular One - A Case Report

Azam M. Makandar*, Avinash Kshar, Raghvendra Byakodi

Department of Oral medicine Diagnosis & Radiology, Sangli, India

*Corresponding author: dr_azam@ymail.com

Received January 03, 2014; Revised January 25, 2014; Accepted February 06, 2014

Abstract Contrast Radiography is a X-ray procedure that uses a special substance; a contrast medium to highlight tissues and organs that would not be visible otherwise. In the past attempts have been made to detect and to see the extent of tumours in nasopharynx using contrast radiography. X ray contrast radiography of a cystic lesion is not reported yet to the best of our knowledge. The radiographic appearance of cystic lesions in jaws may be illusive especially in maxilla owing to the superimpositions by normal anatomic structures. Unilocular or multilocular appearance of lesion has a lot of significance in radiology as radiographic diagnosis may change accordingly. In the present case we performed contrast radiography of an apparently multilocular cystic lesion. For this procedure we used Urografin 76% (aqueous solution of 0.1 g sodium amidotriazoate and 0.66 g meglumine amidotriazoate (sodium diatrizoate and meglumine diatrizoate) as a contrast agent. The technique we demonstrated is a chair-side technique which can be used to differentiate between unilocular and multilocular lesions of the jaws. It also contributes in locating the lesion and determining its extent. It is a cost effective technique which can narrow down the range of differential diagnosis.

Keywords: contrast radiography, unilocular, multilocular cystic lesion

Cite This Article: Azam M. Makandar, Avinash Kshar, and Raghvendra Byakodi, "Use of Contrast Radiography to Differentiate Unilocular Cystic Lesion from Multilocular One - A Case Report." *Oral Surgery, Oral Medicine, Oral Radiology*, vol. 2, no. 1 (2014): 1-5. doi: 10.12691/oral-2-1-1.

1. Introduction

Contrast Radiography is a X-ray procedure that uses a special substance; a contrast medium to highlight tissues and organs that would not be visible otherwise. In the past attempts have been made to detect and to see the extent of tumours in nasopharynx using contrast radiography [1]. X ray contrast radiography of a cystic lesion is not reported yet to the best of our knowledge. The appearance of cystic lesions in jaws may be illusive especially in maxilla owing to the superimpositions by normal anatomic structures. Unilocular or multilocular appearance of lesion has lot of significance in radiology as radiographic diagnosis may change accordingly. But the apparently multilocular cystic lesion does really have multiple locules always? The quest for the answer leads us to contrast radiography. In the present case we performed contrast radiography of an apparent multilocular cystic lesion and to our surprise we found it to be unilocular.

2. Case Report

A 45 year old female patient reported to the department of oral medicine and radiology Vasantdada Patil Dental College and Hospital, Sangli with the chief complaint of swelling in palatal region. She noticed small swelling in

the palatal region one month back which gradually increased to the present size. She did not notice any discharge from the swelling. She did not give any history of pain and fever. She gave history of trauma to the upper front region of the jaw at the age of 14yrs. Medical history showed that she was hypertensive and was on medication (Tablet Atenolol-25mg O.D.) for the same since past 5 years.



Figure 1. Swelling with well defined borders is seen on anterior portion of the palate posterior to incisive papilla

General examination and Extra-oral examination was non-contributory. Intra-oral examination (Figure 1) showed solitary, ovoid swelling situated just posteriorly to

the incisive(palatine) papilla on right half of the anterior hard palate extending from midpalatine raphae medially to the upper right first and second premolar laterally. Anteroposteriorly it extends from just posterior to the incisive papilla to the upper right second premolar region. Approximate dimensions were 1.5cm X 1cm. Borders of the swelling were clearly defined. Colour of the swelling was pink as that of the surrounding palatal mucosa. Surface appeared to be smooth. No visible pulsations were noted. Surrounding tissues appeared to be normal. On palpation all the findings of inspection were confirmed. Swelling was non tender and variable in consistency i.e. soft in the center and bony hard at the periphery. Crepitus was present. Regional lymph nodes were non palpable. Examination of teeth revealed completely discolored upper right central incisor (Figure 2).

Rest of the dentition was normal. Electric pulp vitality testing with digital pulp vitality tester revealed non vital upper right central and lateral incisors. On the basis of history and clinical examination a provisional diagnosis of Radicular Cyst was made. Palatal space abscess, Nasopalatine cyst, Midpalatine cyst, Mucoepidermoid carcinoma, mucocele were considered in differential diagnosis. Investigations were done including Intra-oral periapical radiograph, occlusal radiograph, FNAC(fine needle aspiration cytology) of the swelling, protein analysis of the aspirate and contrast radiography of the lesion.



Figure 2. completely discolored upper right central incisor



Figure 3. Intraoral periapical radiograph showing well defined, well corticated, ovoid radiolucent shadow of 1.9 X 1.2 cm (measured at greatest diameter) in the periapical region of upper right central and lateral regions. Radiopaque line traversing the radiolucent shadow in superior one third is seen

Intraoral periapical radiograph (Figure 3) of the same region revealed well defined, well corticated, ovoid radiolucent shadow of 1.9 X 1.2 cm (measured at greatest diameter) in the periapical region of upper right central and lateral regions. Radiopaque line traversing the radiolucent shadow in superior one third was seen. Also internal and external root resorption with upper right central incisor was evident. Root canal of the upper right lateral incisor appeared to be completely calcified. Maxillary anterior occlusal radiograph (Figure 4).



Figure 4. Maxillary anterior occlusal radiograph showing well defined, well corticated, ovoid radiolucent shadow in the periapical region of upper right central and lateral regions. Radiopaque line traversing the radiolucent shadow in superior one third is seen suggestive of multilocular lesion

Of the same region supported findings evident by intraoral periapical radiograph and radiopaque line traversing the radiolucent shadow in superior one third was seen suggestive of multilocular lesion.

Positive aspiration can distinguish between cysts and tumours. Colour and contents of the aspirate can be diagnostic of particular cyst hence we decided to perform FNAC (fine needle aspiration cytology). Palatal surface was anesthetized using 4% lignocaine topical anesthetic spray. 21 gauge needle attached to 10ml disposable syringe was inserted through fenestration present in the center of swelling. It yielded straw colored fluid containing abundant shiny granules indicative of cholesterol crystals (Figure 5).



Figure 5. shows straw colored fluid yielded on aspiration containing abundant shiny granules

Fluid was mounted on slide and was observed under light microscope with 10x and 40x lens revealed "cholesterol crystals with broken corners" (Figure 6).

Protein analysis of the aspirate showed protein content of 6.5 gm/dL suggestive of non-keratinizing cyst.

To rule out whether the radiopaque line in IOPA and occlusal radiograph was suggestive of septa within the lesion or superimposition by normal anatomic structures and also to define the extent of lesion we decided to perform contrast radiography of a cystic lesion.

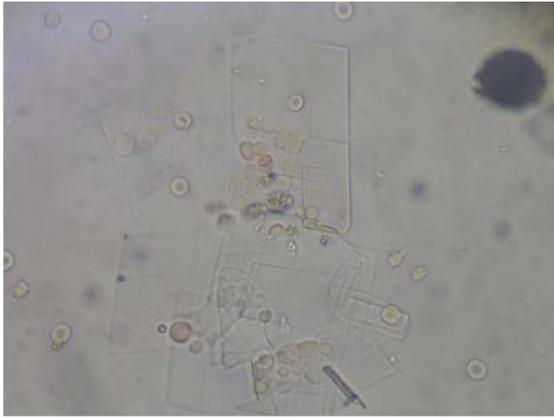


Figure 6. Photomicrograph showing cholesterol crystals with broken corners under 40x

2.1. Contrast Radiography



A



B

Figure 7. Both the Radiographs show uniform filling of the cystic cavity by injected contrast media evident by homogenous radiopaque shadow, the lesion appears to be unilocular

Before initiation of the procedure patient was questioned for any allergy to sea-food and iodine. Patient did not have any history of thyroid disorders and did not

show any signs and symptoms of thyroid disorders. For this procedure we decided to use Urografin 76% (aqueous solution of 0.1 g sodium amidotrizoate and 0.66 g meglumine amidotrizoate (sodium diatrizoate and meglumine diatrizoate) as a contrast agent. Palatal mucosa was pretreated with Betadine oral antiseptic solution for antiseptis. Urografin was warmed in incubator to the 37°C temperature. 1 ml of Urografin was injected into the lesion using 26 gauge needle and 2 ml disposable syringe, over a period of 1 minute. Point of entry for the needle was through the fenestration in the center of the lesion. No hypersensitivity reaction was evident during and after the procedure. Another intraoral periapical radiograph and Maxillary occlusal radiograph were taken immediately after injection of contrast agent. The radiographs were taken at the same vertical and horizontal angulations and with the same exposure parameters as that of diagnostic radiographs. All the radiographs were processed using Kodak automatic film processor. Both radiographs showed uniform filling of the cystic cavity by injected contrast media evident by homogenous radiopaque shadow (Figure 7).

The lesion appeared to be unilocular. Hence contrast radiography of the lesion excluded the possibility of lesion being multilocular, which again contributed to the diagnosis of Radicular cyst (unilocular appearance is most common). Patient was stable after the procedure and no post procedure complications were observed. Post procedure radiographs were also taken to ensure the emptying of the cavity. Later, patient was referred to the dept. of oral surgery where, Cyst was enucleated and specimen was sent for the histopathologic examination. It confirmed specimen as “radicular cyst” (Figure 8).

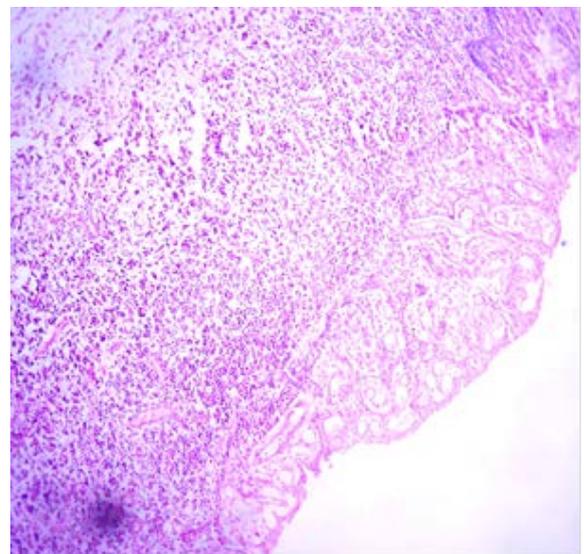


Figure 8. Photomicrograph showing Non Keratinized Stratified Squamous Epithelial Lining of Varying thickness. The epithelial lining is proliferating and show arcaiding

Maxillary right central and lateral incisors were extracted owing to the inability to restore these teeth endodontically. Later on intentional root canal treatment was carried out with maxillary right canine for prosthesis. Patient is asymptomatic for last nine months. Radiographic examination after nine months at the time of follow up showed decrease in the dimensions of

radiolucency and evidence of new bone formation (Figure 9).

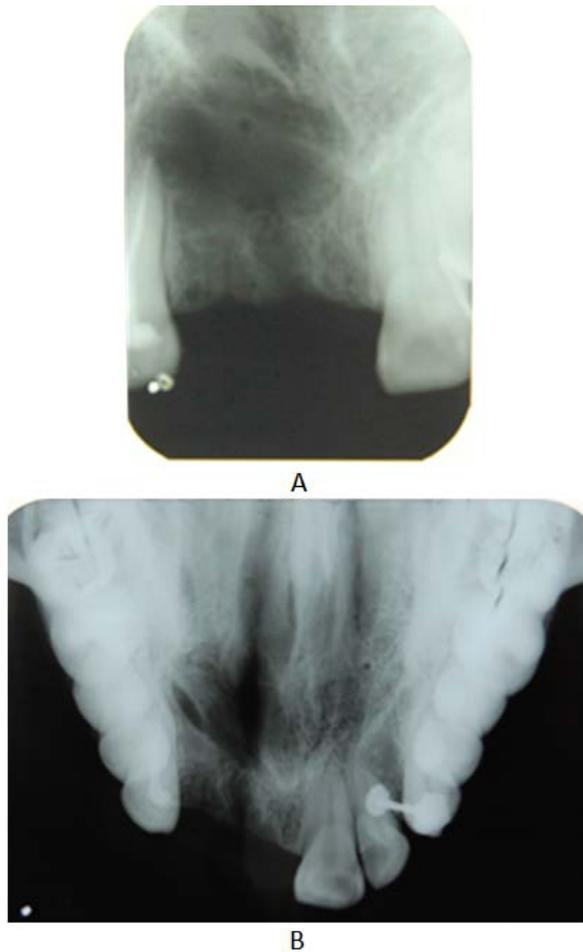


Figure 9. Follow up Radiographs after nine months show decrease in the dimensions of radiolucency and evidence of new bone formation

3. Discussion

The term cyst is derived from the Greek word *Kystis* meaning sac or bladder [2]. The radicular cyst is a chronic inflammatory lesion with a closed pathologic cavity, lined either partially or completely by non-keratinized stratified squamous epithelium [3,4]. It arises from the epithelial residues (cell rests of Malassez) in the periodontal ligament as a result of inflammation [5]. There are two distinct categories of periapical cysts, namely, those containing cavities completely enclosed in epithelial lining, and those containing epithelium-lined cavities that are open to the root canals. The latter was originally described as 'bay cysts' and has been newly designated as 'periapical pocket cysts'. More than half of the cystic lesions are true apical cysts, and the remainder are apical pocket cysts. An apical cyst is a direct sequel to apical granuloma, although a granuloma need not always develop into a cyst. Due to still unknown reasons, only a small fraction (< 10%) of the periapical lesions advance into true radicular cysts [6]. It commonly occurs in the maxillary anterior region in the third to fifth decade of life, more commonly in men [7]. There may be a slow growing bony swelling or it may be asymptomatic, and this lesion can be discovered unexpectedly on periapical radiographs. As the cyst increases in size, the covering bone becomes very thin

despite subperiosteal bone deposition and the swelling then exhibits 'springiness' and when the cyst has completely eroded the bone, there will be fluctuation. Only when the cyst has completely eroded the bone, there will be fluctuation. In the maxilla there may be buccal or palatal enlargement whereas in the mandible it is usually labial or buccal and only rarely lingual [8]. In our case there was palatal enlargement and a fenestration (bony window) clinically palpable in the center of the swelling. A sine qua non for the diagnosis of a radicular cyst is the related presence of a tooth with a non-vital pulp [8]. Aspiration of the radicular cyst yields a straw coloured fluid abundant with shiny granules (cholesterol crystals). They are identified by their broken corners. Radiographically most radicular cysts appear as round or pear-shaped unilocular radiolucent lesions in the periapical region. Radiographically distinguishing between a granuloma and a cyst is impossible, although some say that if the lesion is larger than 2 cm is more likely to be a cyst [9]. In our case cystic lesion was apparently multilocular on radiographs. Injection of contrast media into such lesion should be followed by filling of one or few locules by contrast media but not the whole cavity. On the contrary post injection radiographs revealed filling of whole cavity by contrast medium; suggesting unilocular lesion. By far the most successful and widely applied contrast agents in use today are the iodinated contrast agents (ICAs), first introduced into clinical practice in the 1950s [10]. Iodine plays a key role in the attenuation of x-rays. The atomic radius of a covalently bonded iodine atom is approximately 133 picometers, which falls within the range of the wavelengths of x-rays: 10 to 10,000 picometers; thus, x-rays are easily attenuated by the iodine atoms [11]. In the present case we used iodinated contrast agent, Urografin 76 % (1 mL Urografin 76% contains 0.1 g sodium amidotrizoate and 0.66 g meglumine amidotrizoate (sodium diatrizoate and meglumine diatrizoate) in aqueous solution. It is also used for sialography. Contraindications of the Urografin include hyperthyroidism, decompensated cardiac insufficiency. Adverse reactions to the Urografin are hypersensitivity, thyroid dysfunction. The reactions may be severe in elderly patients. Intravascular use may precipitate acute renal failure [11]. It can cause lactic acidosis in patients who are taking biguanides. Urografin is not to be used for myelography, ventriculography or cisternography, since it is likely to provoke neurotoxic symptoms in these examinations. During intravenous procedures upto 50 ml of contrast media can be injected safely [12]. In our case we injected minute quantity of a contrast media which is unlikely to produce any systemic effects other than hypersensitivity. Although periapical granuloma and a radicular cyst cannot be distinguished by radiographic features alone, if the radiolucency is 1.6mm or more in diameter or 200mm [2], it is more likely to be a cyst [13,14]. In our case measured greatest diameter of a lesion on radiograph was 1.9 mm which supported our diagnosis. Palatine space abscess is painful can be somewhat soft and fluctuant and yields pus on aspiration. Midpalatine cyst is an uncommon bony cyst that develops in the midline of the palate posterior to the palatine papilla. Patient with a midpalatine cyst may complain of a painless bulging that is increasing in size in the roof of mouth. It appears as unilocular radiolucency in midline of the palate

on radiographs. Aspiration of the cyst will produce an amber coloured fluid. In our case swelling was present lateral to the midline on both clinical and radiographic examinations. Also aspiration of the cyst in our case produced straw coloured fluid [15]. Cysts of the incisive canal and of the palatine papilla are subclassifications of nasopalatine cysts originating in nests of epithelium that remain after the disintegration of the nasopalatine duct. It is an early fetal structure present within incisive canal [16]. Incisive canal cyst is evident as heart shaped radiolucency on occlusal and periapical radiographs of the maxillary central incisor area. Frequently its image is projected over the apices of the central incisors. It is associated with vital teeth. In our case both central and lateral incisors were non vital. A cyst of palatine papilla is located in soft tissue so is not demonstrable on radiographs [16]. Mucoepidermoid carcinoma and mucocele are assigned a low rank in the differential diagnosis. But they do not yield fluid on aspiration. Low grade mucoepidermoid carcinoma may yield viscous, clear, sticky liquid (concentrated mucous). These tumors may be seen most frequently in the lateral aspect of the posterior palate in the region of the anterior palatine foramen. In our case swelling was situated anteriorly and aspiration yielded a straw colored fluid [16].

4. Conclusion

The technique we demonstrated is a chair-side technique which can be used to differentiate between unilocular and multilocular lesions of the jaws. It also contributes in locating the lesion and determining its extent. It is a cost effective technique which can narrow down the range of differential diagnosis.

References

- [1] Gordon Evison, Contrast radiography of the nasopharynx, Postgrad. med. J. (November 1968) 44, 825-829.
- [2] P.N.R. NAIR, New perspectives on radicular cysts: do they heal? *International Endodontic Journal* (1998) 31, 155-160.
- [3] Ramachandran Nair PN, Pajarola G, Schroeder HE. Types and incidence of human periapical lesions obtained with extracted teeth. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 1996 Jan; 81(1):93-102.
- [4] Vier FV, Figueiredo JA. Internal apical resorption and its correlation with the type of apical lesion. *Int Endod J.* 2004 Nov; 37(11):730-7.
- [5] Grossman LI. Origin of microorganisms in traumatized, pulpless, sound teeth. *J Dent Res* 1967 46:551-53.
- [6] Nair PNR. Non-microbial etiology: periapical cysts sustain post-treatment apical Periodontitis. *Endodontic Topics* 2003;6: 96-113.
- [7] Joshi NS, Sujan SG, Rachappa MM. An unusual case report of bilateral mandibular radicular cysts. *Contemp Clin Dent* 2011; 2: 59-62.
- [8] Shear M. Cysts of the Oral Regions, 3 edition, Boston, Wright, 1992 .pp. 136-70.
- [9] Cawson RA, Odell EW, Porter S .Cawson's essentials of oral pathology and oral medicine.7th ed, Churchill Livingstone, Edinburgh, 2002. pp. 102-21.
- [10] Christiansen C. X-ray contrast media: an overview. *Toxicology.* 2005;209(2):185-187
- [11] Dean JA, ed. Lange's Handbook of Chemistry. 14th ed. New York, NY: McGraw Hill; 1992:4.18.
- [12] Data sheet provided by manufacturers of Urografin
- [13] Kizil z, Energin: An evaluation of radiographic and histopathological findings in periapical lesions, *J Marmara Univ. Dent Fac* 1:16-23,1990.
- [14] Lalonde E R: A new rationale for the management of periapical granulomas and cyst; an evaluation of histopathologic and radiographic findings-*J Am Dent Assoc*-80; 1056-1059,1970.
- [15] Norman k.Wood, Paul W.Goaz, *Differential Diagnosis of oral and maxillofacial lesions*, 5th edn, chapter 19, Page no.326.
- [16] Norman k.Wood, Paul W.Goaz, *Differential Diagnosis of oral and maxillofacial lesions*, 5th edn, chapter 19, Page no.303-305.