CASE REPORT

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Bilateral mumps in an adult female mimicking mandibular lesions on panoramic radiography: a case report

Erlina Fauziyah[1*], Lusi Epsilawati[2], Ratih Trikusumadewi Lubis[3]

ABSTRACT

Objectives: The purpose of this case study is to report a case of quite painful facial swelling observed on a panoramic radiograph and diagnosed as Bilateral Mumps.

Case Report: A 34-year-old woman came to the Radiology Department with complaints of throbbing pain accompanied by swelling in the right and left mandible. The swelling has been present for 5 days, and the pain worsens when eating. In addition, the patient complains of having a fever and being unable to sleep. Physical examination revealed a body temperature of 38.6°C; the patient appeared lethargic and weak. Extraoral examination shows the lower part of the face is swollen, symmetrical between the left and right sides, with increased surface temperature of the lesion, and upon palpation, it feels soft and painful when touched. During the intraoral examination, no swelling was observed. The results of the panoramic radiograph examination show a diffuse radiolucent image spread from the angle to the ramus of the left and right mandible. There are no changes in the structure of the cortical bone of the mandible. From the panoramic examination, a suspect radiodiagnosis of bilateral mumps on the right and left mandible was found.

Conclusion: Mumps is an infection of the salivary glands caused by a virus. On panoramic radiography, the image is more indicative of the formation of osteolytic lesions in the form of radiolucent foci with varying diameters and ill-defined borders. Pockets spread in the inflamed area, and in this case, panoramic radiography can recognize the condition.

Keywords: *Mumps, salivary gland infections, panoramic radiograph*
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[1]Residency Program in Dental Radiology, Faculty of Dentistry, Faculty of Dentistry, Universitas Padjadjaran, Bandung, Indonesia 40132

[2]Dentomaxillofacial Radiology Department, Faculty of Dentistry, Universitas Padjadjaran, Bandung, Indonesia 40132

[3]PMI Hospital, Bogor, Indonesia

[*]Correspondence to:
Erlina Fauziyah
erlinafauziyah@gmail.com

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INTRODUCTION

Mumps is an acute systemic disease caused by the mumps virus (MuV), which belongs to the RNA virus family Paramyxoviridae.[1] Mumps is an infectious disease with moderate to high transmissibility and exclusively affects humans.[2] Mumps virus most commonly affects children, particularly during the winter and spring seasons, but it rarely affects adults. Mumps virus infection involves the salivary glands, primarily the parotid glands.[3] Clinical manifestations of this infection include fever, flu-like symptoms, fatigue, and bilateral swelling of the salivary glands; however, only 30% of patients do not experience parotid gland swelling due to mumps virus infection.[1,4,5] Mumps infection may also cause complications in other organs such as the pancreas, testes, kidneys, eyes, central nervous system, ovaries, and joints.[5]

Transmission of the virus can occur through droplet spread and also through direct contact with contaminated objects.[2] The incubation period of the viral infection ranges from 12 to 24 days.[1] The infectious period begins 2 to 3 days before the onset of swelling and continues until the swelling subsides.[3] Infection occurs through inoculation and replication of the virus starting from the nasal mucosa or upper respiratory tract, then spreading locally or systemically via viremia or infected mononuclear cells. The humoral immune response inhibits viremia, while viral secretion in saliva is inversely proportional to the local production of virus-specific IgA.[2]

Histopathologically, mumps is characterized by acute inflammation mediated by a cellular immune response. Microscopically, there is prominent infiltration of mononuclear cells, particularly lymphocytes and macrophages, within the interstitial tissue of the salivary glands.[6,7] In some chronic cases, glandular lobules may exhibit atrophy due to prolonged inflammation, occasionally accompanied by the formation of small non-caseating granulomas as part of the immune response.[6]

Radiographically, mumps does not present with pathognomonic features, largely due to the limited ability of conventional imaging to depict soft tissue detail. However, certain findings may be observed, such as increased soft tissue density and displacement of adjacent structures due to parotid gland swelling. Facial contour changes or asymmetry may also be evident.[8,9]

Radiographic examination serves as a valuable adjunct in establishing a diagnosis, determining treatment planning, and conducting post-treatment evaluation in the field of dentistry.[10] Conventional radiographs, such as panoramic imaging, are often the first-line choice for evaluating lesions in the jaw because they provide a comprehensive view of the teeth, jaws, and surrounding soft tissues in a single image.[11] Additional advantages of panoramic radiography include its relatively low cost, low radiation dose, and quick acquisition time. Furthermore, two-dimensional radiographs are obtained without the use of special effects and are considered an appropriate initial step in visualizing the major salivary glands.[8] In this case, the pathology involves the salivary glands, which are generally difficult to assess using 2D radiography, such as panoramic radiographs. However, in this patient, the panoramic image revealed specific radiographic features indicative of an inflammatory process. Typically, mumps cases are identifiable only through more advanced imaging modalities such as Multidetector CT (MDCT), ultrasound (USG), and magnetic resonance imaging (MRI).

The primary objective of this case report is to present a case of painful, symmetric swelling of the lower face, which was subsequently diagnosed as mumps.

CASE REPORT

A 34-year-old female presented to the dental radiology department at PMI Hospital Bogor with a referral for panoramic radiographic examination. The patient reported swelling in both the right and left mandibular regions, accompanied by throbbing pain that worsened with mastication. The swelling had been present for five days and was initially not considered bothersome; however, the pain progressively increased, leading to significant discomfort. On physical examination, the patient's body temperature was 38.6°C, and she appeared weak and lethargic. Extraoral inspection revealed bilateral, symmetrical swelling of the lower face with increased surface temperature. Palpation indicated soft, tender swelling, while intraoral examination showed no evidence of intraoral swelling.

Figure 1. Visible swelling of the lower face, bilaterally symmetrical, resulting in facial contour alteration

Figure 2. Panoramic radiography of the patient

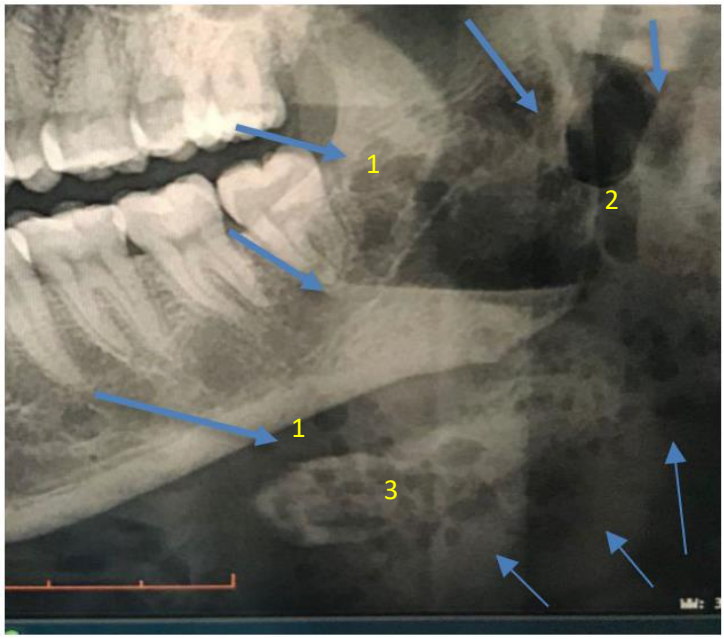

Figure 3. Left panoramic radiographic section

A diffuse radiolucent area is observed within the soft tissue region extending from the mandibular angle superiorly toward the left parotid gland region. The inferior extent reaches the area adjacent to tooth 36, corresponding to the anatomical location of the left submandibular gland. Multiple ill-defined radiolucent soft tissue shadows are noted, superimposed over the mandibular ramus and angle, without evidence of cortical bone disruption or trabecular alteration. The superior radiolucent region (indicated by arrows) corresponds to enlargement of the left parotid gland, measuring approximately up to 8 cm in its greatest dimension. Inferiorly, a relatively well-defined but non-corticated radiolucent shadow represents enlargement of the left submandibular gland measuring around 3-4 cm.

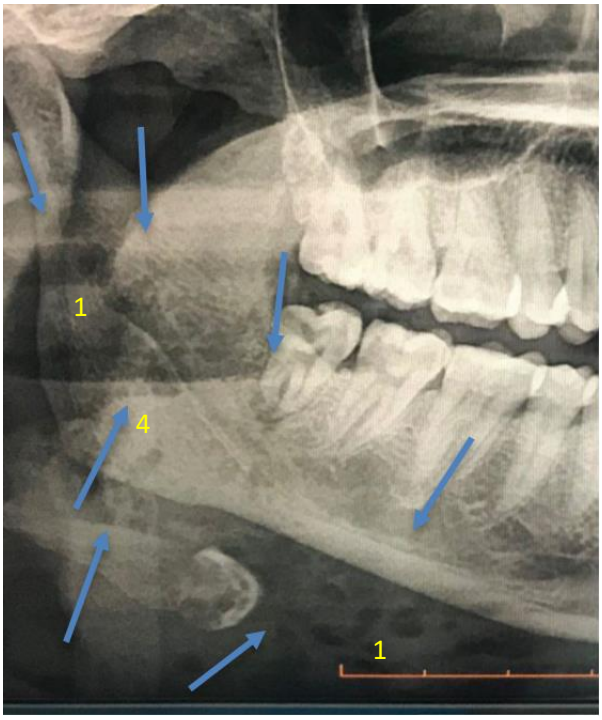

Figure 4. Right panoramic radiographic section

A radiolucent area is observed occupying the soft tissue region extending from the mandibular angle superiorly toward the right parotid gland, with the inferior boundary reaching the region of tooth 36, corresponding to the right submandibular gland. The extent of involvement is less prominent compared to the left side. The submandibular gland appears enlarged, measuring approximately 3–5 cm.

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Panoramic radiograph analysis revealed multiple ill-defined radiolucent spots, ranging in size from 1 to 4 mm, present on both the right and left sides. On the left side, the lesions were distributed around the parotid region, with radiolucent spots superimposed along the mandibular ramus extending up to the area anterior to the ear, without evidence of bone destruction. The edematous area in the left submandibular gland also exhibited multiple radiolucent spots, contributing to glandular swelling measuring approximately 3–4 cm. On the right side, similar radiolucent spots were noted in the region of the right mandibular ramus and angle, with radiolucencies extending into the right parotid and submandibular gland areas. This resulted in submandibular gland enlargement of approximately 2–3 cm and parotid gland enlargement limited to the width of the right ramus, with radiolucent spots superimposed over the mandibular ramus bone. Based on these findings, a diagnosis of bilateral mumps (left and right) was made. The patient was subsequently provided with health education and prescribed antiviral medication, vitamins, and anti-inflammatory drugs.

DISCUSSION

The aim of this case study is to report a case of bilateral mumps involving both the left and right mandible, as visualized on panoramic radiography. Mumps was first described by Hippocrates, and its viral etiology was confirmed by Johnson and Goodpasture in 1930.6 Approximately 70% of mumps cases are symptomatic, typically beginning with a prodromal phase characterized by fatigue, myalgia, anorexia, and low-grade fever.[12] Following the prodromal phase, patients develop painful swelling of the parotid glands. The swelling usually starts unilaterally and subsequently becomes bilateral.[1,4,5,12,13]

Mumps is an infectious disease that primarily affects the salivary glands and most commonly occurs in children. It is caused by the mumps virus (MuV), although it can also affect adults.[14] In this case report, the patient was a 34-year-old female presenting with throbbing pain, weakness, fatigue, fever, and bilateral swelling in both the right and left mandibular regions. These clinical findings are consistent with the characteristic signs and symptoms observed in patients with mumps.

The etiology of mumps is an infection caused by the mumps virus (MuV), which belongs to the Paramyxoviridae family, the same group as the parainfluenza and Newcastle disease viruses.[4,15] This virus has a single-stranded RNA genome and can be detected in saliva, cerebrospinal fluid, urine, blood, breast milk, and infected tissues of patients with mumps.[6,15] Mumps is transmitted via the upper respiratory tract through droplet spread. The virus replicates in the nasopharyngeal epithelium and regional lymph nodes. After an incubation period of 12 to 25 days, viremia occurs and typically lasts 3 to 5 days.[15] During this viremic phase, the virus disseminates to various tissues, including the meninges, pancreas, salivary glands, testes, and ovaries. This systemic spread leads to the characteristic clinical manifestation of painful parotid gland swelling, which peaks within 48 hours.[1,15]

Mumps more frequently affects the parotid gland compared to other salivary glands due to several physiological and anatomical factors. The mumps virus exhibits a high tropism for glandular epithelial tissue, particularly targeting acinar cells within the salivary glands. Among these, the parotid gland is the most susceptible due to its high density and secretory activity, which increases its vulnerability to viral infection.[16,17] Anatomically, the parotid gland's duct (Stensen's duct) opens directly into the oral cavity near the upper molars, which facilitates exposure to viral particles from the upper respiratory tract and oral cavity.[18] Moreover, the parotid gland is the largest and most superficial of all the major salivary glands, making it more susceptible to systemic infections that spread hematogenously during the viremic phase, a key feature in the pathophysiology of mumps.[19]

The symptoms caused by mumps typically resolve within 7–10 days and can be self-limiting; however, supportive therapy is still necessary, especially if symptoms are severe or secondary complications arise.[1] In this case, the patient experienced bilateral swelling in the right and left mandibular regions for five days, which falls within the incubation period of the disease caused by mumps virus infection (Figure 1).

Radiographic examination plays a critical role in the diagnosis of mumps, particularly when involving the salivary glands, especially the parotid glands. A CT scan can demonstrate diffuse and symmetrical enlargement of the parotid glands.[20] Additionally, the presence of subcutaneous fat stranding surrounding the gland indicates inflammation of the soft tissue, and the homogenous contrast enhancement of the parotid gland after contrast administration suggests edema without evidence of abscess or sialolithiasis.[20,21] MRI shows hyperintensity on T2-weighted images and homogeneous hyperintense enhancement on T1-weighted images, indicating inflammation without abscess or mass.[21] Ultrasound typically reveals enlarged parotid glands with heterogeneous echotexture, and color Doppler imaging demonstrates hypervascularity due to inflammation; hypoechoic nodules may also be visible.[22,23] In this case, panoramic radiography was utilized, revealing radiolucent patches filling the soft tissue area from the angle of the mandible superiorly toward the left parotid region, with the inferior border extending to the region of tooth 36 near the left submandibular gland (Figure 3). The parotid gland was enlarged up to 8 cm, and the submandibular gland measured approximately 3–4 cm. On the right side, radiolucent patches filled the soft tissue from the mandibular angle superiorly toward the right parotid region, with the inferior border extending to the region of tooth 36 near the right submandibular gland, though less extensive than on the left. The submandibular gland was

enlarged to 3–5 cm (Figure 4).

Table 1. Differences in Mumps Imaging Findings on CT, MRI, Ultrasound, and Panoramic Modalities.[1,17,2]

Modality	Radiological Findings
CT Scan	- Symmetrical enlargement of the parotid glands - Subcutaneous fat stranding - Homogeneous contrast enhancement - Absence of abscess or sialolithiasis
MRI	- Hyperintense signal on T2-weighted images (indicating edema) - Homogeneous signal enhancement on T1-weighted images post-contrast - No visible mass or abscess
USG	- Enlargement of the parotid gland - Heterogeneous echotexture - Hypervascularization on Doppler imaging - Presence of hypoechoic nodules
Panoramic	- Radiolucent foci - Enlargement of salivary glands

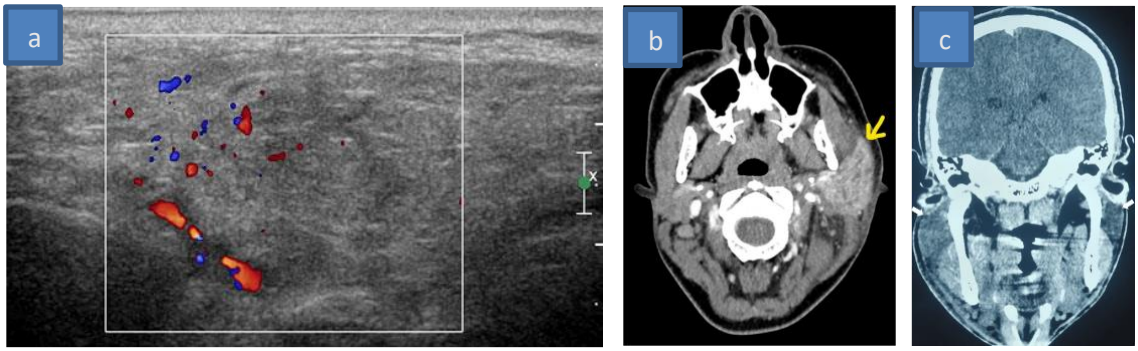

Figure 5. (A). USG with color doppler of the salivary gland: demonstrates an enlarged salivary gland with heterogeneous hypoechoic echotexture. Color Doppler reveals increased vascularity within the gland, indicating hyperemia associated with inflammatory changes.[24] **(B).** Axial CT Scan of the neck: demonstrates diffuse enlargement of the parotid gland (arrow) with increased attenuation of the surrounding soft tissues. There is evidence of fat stranding adjacent to the gland, indicating inflammatory changes. No abscess formation or focal mass is identified. These findings are consistent with salivary gland inflammation associated with mumps.[1] **(C).** MRI: hyperintense signals on T2-weighted images reflecting glandular edema, with homogeneous enhancement on post-contrast T1-weighted sequences indicating diffuse inflammatory involvement. The absence of focal mass or abscess formation further supports a diagnosis of viral sialadenitis, particularly mumps.[17]

Based on the information above, it indicates that, in addition to CT Scan, MRI, and Ultrasound, panoramic radiography can also be utilized as an alternative adjunctive tool in the diagnosis of mumps. Moreover, conventional radiographic examinations, such as panoramic radiographs, are frequently used as an initial step or screening modality in the evaluation of jaw lesions, as they provide a comprehensive view of the teeth, jaws, and surrounding soft tissues in a single image.[11,25]

CONCLUSION

Mumps is a viral infection affecting the salivary glands, particularly the parotid glands. On panoramic radiography, the findings in this case appear as multiple ill-defined radiolucent soft tissue shadows with varying diameters, superimposed over the mandibular region. These appearances differ from true osteolytic bone lesions, as no cortical bone destruction or trabecular alteration is observed. Compared to normal panoramic anatomy, where soft tissue structures are typically faint or not clearly visualized, the increased radiolucency in this case reflects inflammatory enlargement of the salivary glands. Therefore, panoramic radiography may provide indirect signs of salivary gland inflammation, although correlation with clinical findings and advanced imaging modalities remains essential for definitive diagnosis.

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FOOTNOTES

All authors have no conflict of interest to declare in this article. Informed consent was obtained from the patient being included in this case report.

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