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Case Report

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Contrast-Induced Sialadenitis of the Submandibular Glands: Case Report and Review of the Literature

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Abstract

Contrast-induced sialadenitis, often referred to as “iodide mumps,” is a rare but well-documented adverse reaction associated with the intravenous administration of iodinated contrast media. Characterized by an acute, painless and transient swelling of the salivary glands most frequently the parotid glands iodide mumps remains a benign condition that generally resolves spontaneously within a short period. Although the exact pathophysiology is not fully understood, several hypotheses have been proposed, including hypersensitivity reactions, toxic glandular edema, or transient obstruction of the glandular ducts. As the use of computed tomography (CT), angiography, and other imaging modalities requiring iodinated contrast continues to grow, it becomes increasingly important for radiologists and clinicians to recognize this condition. Understanding its presentation, diagnostic approach, management strategies, and prognosis helps ensure that patients receive appropriate care, are spared unnecessary investigations, and benefit from timely reassurance.

Introduction

Iodinated contrast media have revolutionized diagnostic imaging, enabling clinicians to better visualize anatomical structures and vascular patterns in a wide range of medical conditions. Their widespread use, however, is occasionally accompanied by adverse reactions. Mild allergic-type reactions, such as urticaria, are relatively common, while severe responses (i.e., anaphylactic shock) remain rare. Among these infrequent complications is a peculiar and benign entity known as iodide mumps or contrast-induced sialadenitis, first described by Sussmann and Miller in 1956. [1]

Iodide mumps presents as an acute enlargement of the salivary glands most commonly the parotid glands — in the hours following exposure to intravenous iodinated contrast agents.[2-7] Although it is rare and generally self-limiting, iodide mumps can be alarming to both patients and clinicians. Identifying this condition promptly helps prevent unnecessary diagnostic workups for other conditions, such as bacterial infections, sialolithiasis, or more severe allergic reactions.

This article presents a case of iodide mumps and reviews its clinical features, possible underlying mechanisms, diagnostic approach, management strategies, and prognosis. It also provides a review of the literature regarding this condition.

Case report

A 70 year-old woman, previously diagnosed with colorectal cancer, presented to the emergency department because of a painless enlargement of the submandibular region. The previous day the patient underwent a CT scan of the abdomen with iodinated contrast medium (iopromide, Ultravist® 370 mg/mL, 110 mL intravenous). She had no fever, and didn’t complain of respiratory symptoms. The clinical exam revealed an enlargment of both the parotid glands, with mild pain at palpation. The patient was in good condition, and the rest of the visit was unremarkable. The laboratory exams (including serum creatinine)

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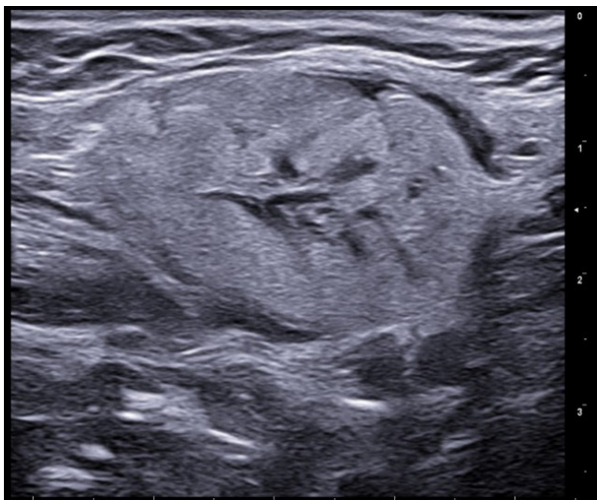

Figure 1a

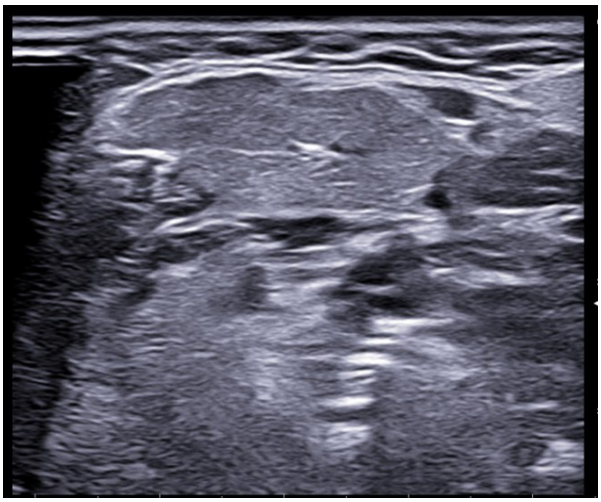

Figure 2a

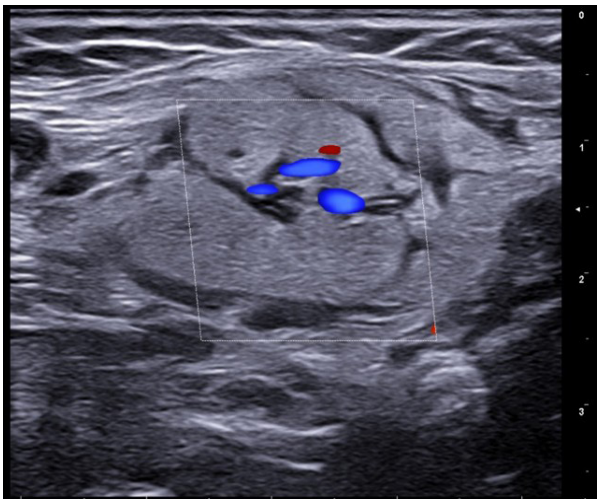

Figure 1b

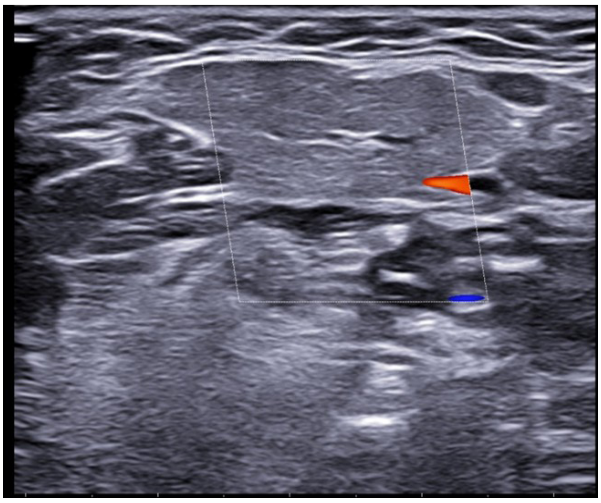

Figure 2b

were normal, except for amylase, that was double the upper limit (200 UI/L). The bedside ultrasound (US) showed an enlargment of both submandibular glands, with prominent hypoechoic septae (fig. 1a). The doppler signal was diffusely increased, suggesting hypervascularization of the glands (fig. 1b). The parotid glands were normal. The patient was diagnosed with iodide mumps, and she was prescribed oral corticosteroids. The symptoms resolved 48 hours later, and the US of the submandibular region showed the complete resolution of the edema of the glands (fig. 2a and 2b).

Epidemiology and Clinical Features

Iodide mumps is recognized as a rare complication. Its true incidence is difficult to establish given the scarcity of reports and the likelihood that mild cases go undocumented. Cases have been reported worldwide, across a spectrum of imaging procedures involving iodinated contrast, including CT scans, angiographic procedures, pyelography, and other contrast-enhanced studies. [7] Chronic renal failure is considered to be a risk factor for this adverse reaction. A large amount of injected iodide is initially secreted in the salivary glands and subsequently reabsorbed, [8] but the kidneys ultimately eliminate the most part (about 98%), and only 2% of iodide is excreted from salivary, sweat and lacrimal glands. Furthermore, these percentages can be altered in case of renal insufficiency, resulting in a higher concentration of contrast medium in the salivary ductal system. [8-10]

Clinical Presentation

Patients typically present with a sudden onset of painless or minimally painful swelling in one or more salivary glands — most frequently the parotid glands — minutes to a few days after receiving iodinated contrast. Both unilateral and bilateral involvement can occur. While the parotids are the most commonly affected, submandibular gland swelling has also been reported in rare instances. [7] Accompanying symptoms may be limited to a sense of discomfort or fullness in the cheeks or near the angle of the jaw or in the submandibular region. Trismus is uncommon. Importantly, systemic symptoms such as fever or significant malaise are not typical, helping distinguish iodide mumps from infectious etiologies.

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Natural History

The edema usually resolves spontaneously within 24 to 72 hours without specific intervention. Recurrent episodes have been documented in patients who receive iodinated contrast multiple times, but this remains a rare scenario.

Pathophysiology

The precise mechanism underlying iodide mumps remains unclear, but several pathophysiological theories have been proposed. [2-3, 5, 7] 1. Hypersensitivity Reaction: one proposed mechanism is a non-IgE-mediated hypersensitivity reaction. Iodinated contrast media may trigger acute glandular inflammation and edema, leading to temporary enlargement. 2. Toxic Glandular Edema: Contrast agents might exert a direct toxic effect on the salivary ductal or acinar cells. This could impede normal saliva outflow, causing an accumulation of fluid and subsequent gland swelling. 3. Osmotic effect another hypothesis suggests that iodine-rich fluid enters the glandular ducts and creates an osmotic gradient. The resulting fluid shift into the gland's tissue may cause swelling. 4. Ductal obstruction Alternatively, transient obstruction of the salivary ducts by viscous secretions altered by the contrast agent could play a role. Despite these theories, definitive scientific evidence pinpointing the exact underlying pathophysiological mechanism remains elusive.

Differential Diagnosis

The sudden onset of salivary gland swelling can have numerous etiologies. It is essential to differentiate iodide mumps from other conditions; some of those pathologies are listed in the following table

Clinical history, timing of contrast exposure, and the benign and transient nature of the swelling are key features that help distinguish iodide mumps from these other entities.

Diagnosis	Clinical features
Acute bacterial sialadenitis	Typically presents with pain, tenderness, erythema, and often fever
Viral infections (e.g. mumps)	Usually accompanied by systemic symptoms, fever, and malaise; the timing relative to contrast administration and patient history helps distinguish these conditions
Sialolithiasis (Salivary Duct Stones)	Usually presents with recurrent episodes of painful swelling related to meals. US may reveal calculi
Sjögren's Syndrome or Other Autoimmune Conditions	Chronic rather than acute, often with accompanying sicca symptoms (dry eyes and mouth)
Allergic Angioedema	Commonly involves other areas of the face, lips, and tongue rather than isolated salivary glands; may be accompanied by urticaria or pruritus.

Diagnostic Approach

Diagnosis is primarily clinical. Important steps include:

1. Detailed History: Inquire about recent exposure to iodinated contrast agents. The temporal correlation between contrast administration and gland swelling is highly suggestive.

2. Physical Examination: Evaluation of gland swelling, tenderness, and the presence or absence of systemic signs is crucial.

3. Imaging Studies: In ambiguous cases, ultrasound or CT imaging may confirm glandular enlargement but often does not reveal a specific cause. The imaging findings are non-specific and serve mostly to exclude other pathologies such as glandular abscesses or stones.

4. Laboratory Tests: Routine laboratory tests are usually normal. If infection is suspected, a complete blood count (CBC) or inflammatory markers (CRP, ESR) might be ordered. Normal results support the benign nature of iodide mumps.

Management and Treatment

The hallmark of iodide mumps management is supportive care. The condition is benign and self-limiting, and swelling typically resolves without intervention. [3]

Conservative measures consist in reassurance; warm compresses and massage; adequate hydration to maintain adequate salivary flow. NSAIDs or analgesics can help alleviate discomfort. Antihistamines or corticosteroids may be considered in cases of recurrent or persistent swelling where an allergic mechanism is suspected.

Follow-Up

Patients usually recover fully within a few days. Follow-up is rarely necessary unless symptoms persist or recur, in which case further evaluation might be warranted to rule out other underlying conditions.

Prognosis and Prevention

The prognosis is excellent. Most episodes are one-time occurrences that resolve without lasting effects. Infrequent recurrences have been reported, suggesting that some individuals may be more susceptible than others.

Risk Factors

There are no well-established risk factors for iodide mumps, and it appears to be an idiosyncratic reaction.

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Patients who experience this condition should inform their healthcare providers before undergoing future contrast-enhanced studies, although premedication or substitution with a different type of contrast agent is not routinely recommended in the absence of other risk factors.

Conclusion

Iodide mumps, or contrast-induced sialadenitis, is a rare yet benign and self-limiting complication of iodinated contrast administration. Recognizing its clinical features and benign course allows healthcare professionals to reassure patients, minimize their anxiety, avoid unnecessary interventions, and focus on supportive care.

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