

Complication Following Instillation of Radio-opaque Substance into the Maxillary Sinus.

— Report of a case —

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X-ray examination of the maxillary sinus by instillation of radio-opaque substance has been usually performed with procedure through the inferior meatus in order to make precise diagnosis of chronic inflammation or tumor.

Generally, this procedure causing visualization of the maxillary sinus by contrast medium is common, relatively simple, and harmless, if it is performed with correct technique. Various undesirable complications, however, may occur with technic failures, dehiscences of the osseous walls of the antrum or various anatomical anomaly of the maxillary sinus. Recently, I have experienced an unfortunate case in which, in order to make precise examination of the maxillary sinus, instillation of radio-opaque substance was performed; however, the needle was inserted into the surrounding tissue of the maxillary sinus at the central portion of posterior wall, and moliolol and infected material flowed out to the surrounding tissue causing abscess.

REPORT OF A CASE

Aged 37 year-old male was admitted to the Department of Otolaryngology, Yamaguchi University Hospital, on December 8, 1965, because of nasal obstruction, choanal discharge, head heavy sensation and intermittent nasal bleeding for several years.

There is no history of serious disease at all except acute appendicitis. Family history is non-contributory.

On examination, both eardrums were clear and normal. Anterior rhinoscopy revealed a large red granular polyp on the left sided nasal cavity and also a large amount of purulent discharge. The septum deviated to the right side. Posterior rhinoscopy showed a large polyp and purulent discharge in the choana. The pharynx and larynx were clear and normal.

On general physical examinations, blood pressure was 132/68 mmHg, pulse 72, regular, body weight 50 Kg, and body temperature 36.7°C. The chest, heart and abdomen were normal.

Electro-cardio-gram revealed normal. Urinalysis was normal. Roentgenographic study of the paranasal sinuses revealed cloudiness of the ethmoid cells and the maxillary sinus on the left side and the thin lateral wall of the maxillary sinus, but no defect (Fig 1).

Studies of systematic blood chemistry showed normal picture, and peripheral blood examination also normal.

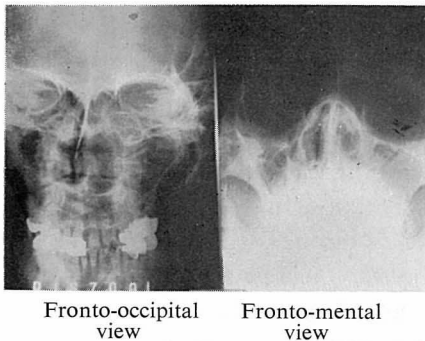


Fig. 1. Simple X-Ray examination of the paranasal sinuses.

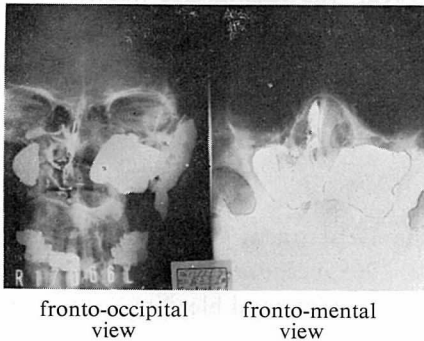


Fig. 2. X-Ray examination of the maxillary sinus by instillation of contrast medium.

In order to make precise examination of the antrum, antrum puncture was performed. Anesthesia was produced by the topical application of 5 % cocaine hydrochloride to the region of the inferior meatuses on the nostrils. Then, the needle was introduced on the left side with ease into where was thought to be the maxillary sinus, and the return flow of mucopurulent fluid from the sinus was usual. Suction was performed without resistance or pain, and about 15 cc of mucopurulent fluid was obtained, but finally slightly bloody. And then, about 10 cc of 40 % moliolol was instilled into the sinus without resistance or pain. Opposite side was also performed, but there was no return flow of secretion, and 5 cc of 40 % moliolol was instilled into the opposite sinus without incident. And then, X-ray was taken by fronto-occipital and fronto-mental method. This X-ray examination by instillation of radio-opaque substance revealed that moliolol had gone into the surrounding tissue of the antrum on the left side (Fig 2).

A few hours later, the patient began to complain of headache, high fever, pain and swelling of the cheek on the left side. Then, antibiotics were administrated, being afraid of inflammation. Next day, antrum puncture was performed again for suction of the content of the antrum and about 40 cc of oilo-muco-purulent fluid was obtained. But headache, high fever, pain and swelling of the cheek persisted. Peripheral blood examination at this time showed moderate leukocytosis with 80 % of neutrophilia.

Two days later, the operation was performed under local anesthesia. The

exposure on the maxillary sinus was tried to evacuate abscess of the surrounding tissue of the antrum.

Operative findings :

After 5 % procaine hydrochloride was injected at the labio-gingival region on the left side, an incision was made as usually. The anterior wall of the maxillary sinus was exposed, but there was no bony defect at all. The maxillary sinus was opened with chisel. The antral mucous membrane was severely edematous swollen and there was retention of a small amount of bloody secretion, which were removed completely. A small round depressed fracture was found in the central

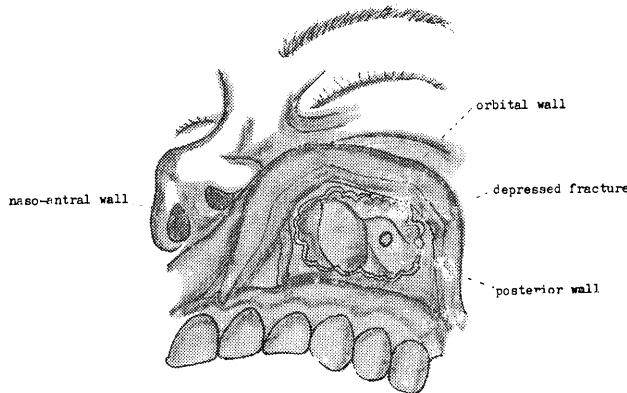


Fig. 3.

portion of the posterior wall on the maxillary sinus. A wide counter opening was made as usually. Then, the bony defect was enlarged, and evacuation of periantral abscess was performed and the surrounding tissue was washed by oxydol solution and saline solution. Finally, nasal polyp was removed. The wound of the canine fossa was kept open. Postoperatively, antibiotics were administered. Severe headache, high fever, pain and swelling of the cheek disappeared rapidly and the patient made a complete recovery without any complication.

DISCUSSION

Puncture or irrigation of the maxillary sinus is a common technique in the diagnosis and treatment of the maxillary sinus disease. The technique is relatively simple, but require reasonable care to avert undesirable consequences.

Complications, however, were relatively not uncommon and even fatalities occurred in the past. For example, in such cases which dehiscences may exist in osseous walls of the antrum, puncture or irrigation of the antrum, whether through the inferior meatus or the natural ostium and the middle meatus, may rise to

infiltration of the tissue of the cheek, eyelids, orbit, pharynx, nasopharynx and neck with air or irrigating solution, or infected material from the maxillary sinus may be extruded into the tissue causing local infections, such as facial cellulitis, and abscess of the orbit, peri-orbital tissue and the surrounding tissue of the maxillary sinus. These same complications may occur, in the absence of osseous defects, with faulty placement of irrigating cannula. Also, it is generally accepted that air may enter the circulation, following insufflation after irrigation, through the veins of the antral mucosa. While it is conceivable that this would happen more often in cases in which the puncture was made through the inferior meatus, it is noteworthy that similar accidents have occurred when the irrigation was performed through the middle meatus or natural opening. Thickened mucous membrane and increased vascularity, which are present in sinus disease, facilitate the possibility of these accidents. According to literatures, various complications have been reported following irrigation of the antrum through both the middle and inferior meatuses.

Fatal complication was air embolism.

Injury to the naso-lacrimal duct may also be incurred. Temporary blindness due to occlusion of the central artery of the retina has been reported, following air insufflation of the antrum.

Ashikawa and Misawa reported a case of orbital cellulitis following the antral puncture, in which moliiodol, instead of gaining entrance into the antrum the intended destination, had gone into the orbital fossa with resulting infections of the surrounding tissue. They stated that the procedures causing visualization of the maxillary sinus by instillation of radio-opaque substances were not without danger, and stressed that as this procedure seemed simple, a care should be given in its institution. Cornfield, E, et al have opinion that if the puncture or irrigation is performed correctly, there is no necessity to follow it up with air, or on other undesirable consequences.

In the present case, in order to make precise examination of the maxillary sinus, instillation of radio-opaque substance was performed. But the needle penetrated the central portion of the posterior wall of the maxillary sinus with technic failure, and moliiodol and infected material flowed out to the surrounding tissue of the antrum, causing abscess. When antrum puncture was performed, the return flow of muco-purulent fluid from the maxillary sinus was usual.

Suction was performed by means of syringe without resistance or pain and about 15 cc of muco-purulent fluid was obtained, but finally slightly bloody. Therefore about 10 cc of 40 % moliiodol was instilled into the sinus. But resistance or pain was not observed at all. It is considered that mispuncture (misplacement) would rise because of the facts that operator was a right-hander with poor experience and antral bony walls were thinner than usual.

In my experience, the procedure causing visualization of the maxillary sinus by instillation of contrast medium is common, relatively simple, but not without danger. Therefore, religious precaution should be given in its institution.

If antrum puncture is performed correctly, there would be able to avert undesirable consequences. Correct technique must be emphasized. When, after local anesthesia, the needle is inserted under the inferior turbinate, it should be easily movable and end of the needle should be free. There should be no pain or resistance while putting in contrast medium. The surest way to determine whether or not the needle is in the right position would be to use syringe first to withdraw air, pus or mucopurulent discharge from the maxillary sinus, or to perform under the fluoroscope.

Only after this is done, an injection of contrast medium should be follow. If there is any difficulty in withdrawing, one should refrain from putting anything further into the maxillary sinus.

As complications following puncture or irrigation of the maxillary sinus, air embolism was most common in the past.

In recent literatures, however, there is no any reported case of fatal air embolism.

Recently, on examination of the maxillary sinus by radio-opaque substances, puncture is performed by inferior meatal approach because of its safety and simplicity in general.

On this procedure, some do irrigation and others not.

SUMMARY AND CONCLUSION

Aged 37 year-old male was reported in whom moliiodol, on procedure of instillation of contrast medium into the sinus, had gone into the surrounding tissue of the maxillary sinus by technic failure with resulting infections of the surrounding tissue.

Fortunately, the patient made a complete recovery without any sequela. I would like to emphasize that procedures causing visualization of the maxillary sinus by instillation of radio-opaque substances are simple, but not without danger, therefore, religious precaution is necessary.

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