

## Case Report

# Maxillary sinus unplugged: dealing with foreign bodies in the maxillary sinus

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### ABSTRACT

Foreign bodies lodged within the maxillary sinus are rare occurrences, presenting diagnostic challenges and requiring tailored surgical interventions. We report a case of male in his mid-sixties, with a history of chronic sinusitis complaining of broke teeth and asking for replacement or the same. Imaging revealed an ectopic tooth lodged within the right maxillary sinus. Infected Schneiderian membrane was intentionally removed and foreign body was removed from the sinus employing innovative techniques to safely remove the foreign body and a long-standing collagen membrane was used to recreate the sinus floor. Postoperatively, the patient experienced complete resolution of symptoms and restoration of sinus function. This case emphasizes the importance of thorough preoperative evaluation and how dental professionals can effectively manage unique cases in their clinical practice with optimal patient outcome in managing maxillary sinus foreign bodies.

**Keywords:** Maxillary sinus, Foreign body, Bone grafting

### INTRODUCTION

Maxillary sinus augmentation (also known as sinus floor elevation) techniques have become an important prerequisite before placement of dental implants in posterior maxillae that do not have sufficient bone left. In 1970s, Hilt Tatum used maxillary sinus cavity to increase available bone using graft material, which allowed greater implant to bone contact area once the bone graft has settled.<sup>1</sup> As of now there are several modifications and techniques used for sinus augmentation along with a number of new options of graft materials.<sup>2</sup>

A very important aspect of sinus augmentation is the anatomy of the maxillary sinus.<sup>3</sup>

Maxillary sinus is pyramidal in shape and is the largest sinus in the paranasal. The average dimensions of the maxillary sinus are 36–45 mm in height, 23–25 mm in width, and 38–45 mm in length (anteroposterior axis).<sup>4</sup>

The average volume of the maxillary sinus is 15 ml. Maxillary sinus is lined by the Schneiderian membrane.<sup>5</sup> This membrane is a pseudostratified columnar respiratory membrane ciliated epithelium formed by the basal cells, columnar cells, and goblet cells fixed to the basal membrane.<sup>6</sup>

Technique used for a particular patient depends on the surgeon's expertise as well as the general makeup of the patient's maxillary sinus.<sup>7</sup>

After proper radiographic investigations, based on the amount of bone left and a length of bone that is required for the procedure is evaluated.<sup>8</sup>

The techniques followed in clinical practice are direct – lateral window technique and indirect – osteotome sinus floor elevation, bone added sinus floor elevation, minimally invasive trans alveolar sinus approach, and antral membrane balloon elevation.<sup>9</sup>

## CASE REPORT

A male in his mid-sixties came to the dental office complaining of missing teeth in both left and right back upper teeth region and wished to replace them.

On examination, multiple root stumps were seen in the maxillary left and right region with a collapsed bite (Figure 1).



Figure 1: Pre op image.

|            |        |              |             |
|------------|--------|--------------|-------------|
| Patient ID | 3325   | Patient Name |             |
| Age        | 62 Yrs | Date         | 3-Aug-18    |
| Gender     | MALE   | Ref Doctor   | Satish Jain |

**CT SCAN PNS**

Above study was performed on MDCT unit and appropriate hard copy documentation done

**Observations:**

Deviated nasal septum towards left side seen indenting inferior turbinate with partial nasal obstruction.

Concha bullosa seen in bilateral middle nasal turbinates.

Soft tissue mucosal thickening noted in bilateral ethmoid, right maxillary and frontal sinuses with blockage of bilateral OM units, underlying bone appears normal – suggestive of sinusitis.

Ectopic tooth noted in right maxillary sinus.

Superior, middle turbinates on either side with their respective meatus appear normal.

Visualized orbits and anterior cranial fossa are normal.

No evident bony erosion / destruction is seen.

No evident mass is seen the region of nasopharynx or para pharynx.

Figure 2: Pre op CT scan.

Patient was asked about his previous medical history. He had chronic sinusitis and it was reported that he had previously undergone functional endoscopic sinus surgery twice in the past 1 year.

He was asked to get essential radiographic investigations (CBCT). Pre operational CBCT which was done at a private center in Jaipur, India revealed a foreign object in the right maxillary sinus. It was hypothesized that it could be an ectopic tooth (Figure 2).

After administration of local anesthesia (2% lidocaine with 1:80,000 epinephrine) a full thickness flap was raised extending from 14 region till 16 region using a 15C blade (Figure 3).

Using a skin marking pen, an outline was marked for the lateral window on the buccal bone. Using a high-speed hand piece with a diamond bur the bone is cut with paintbrush stroke, thereby exposing the membrane.

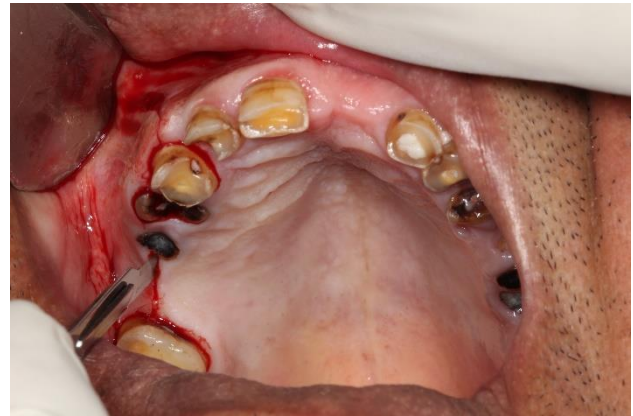


Figure 3: Incision and flap reflection.

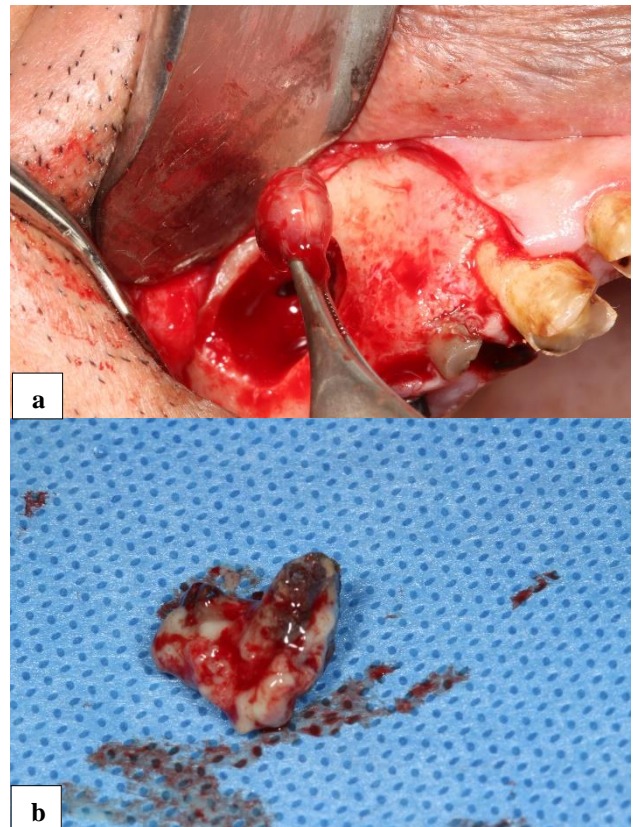
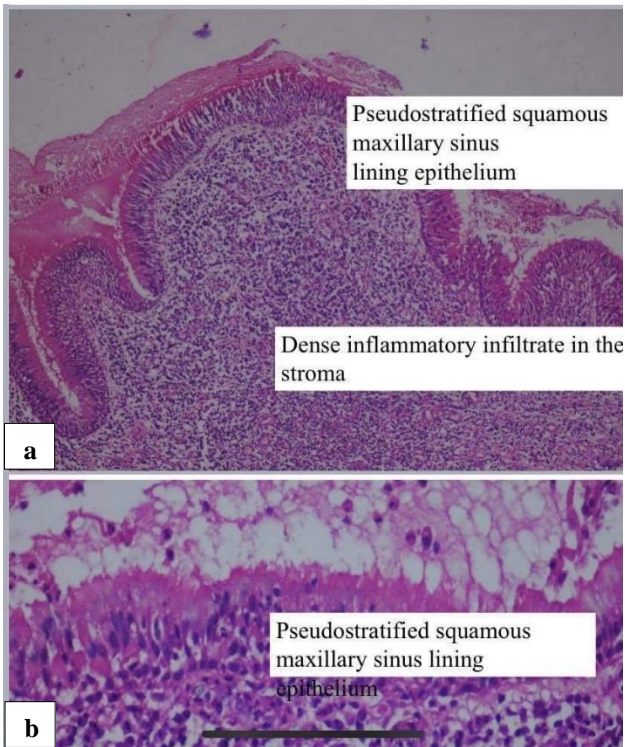


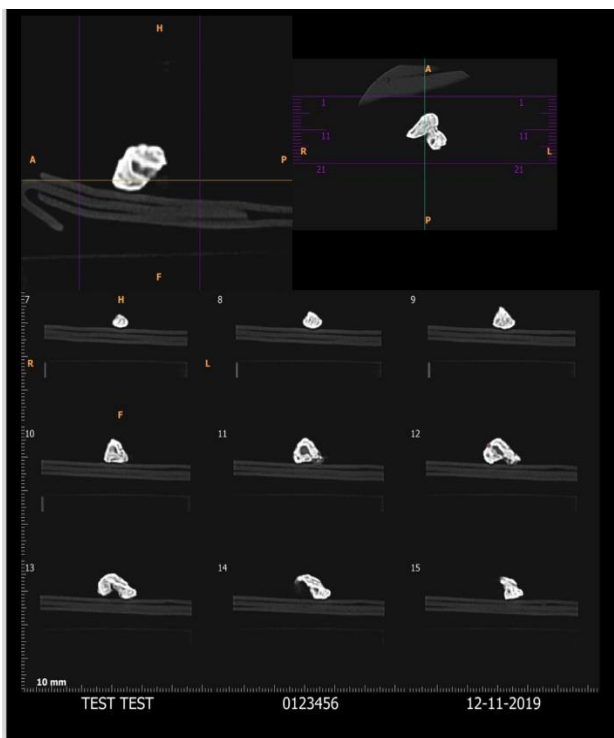
Figure 4: (a) Cystic lining removal and (b) foreign body.

An incision was given on the Schechnerian membrane on purpose and the infected sinus lining was removed followed by extraction of the “ectopic tooth” (Figure 4a and b).

The Schechnerian membrane was repaired using a membrane and bone grafting was done, finally it was closed with a second membrane and secured with tacs.



**Figure 5 (a and b): Histopathology of infected sinus lining.**



**Figure 6: CBCT of foreign body.**

Implants were placed in 15 and 16 regions and the wound was closed using vicryl rapide (polyglactin 910) 3-0 sutures. Haemostasis was achieved. The infected sinus lining was sent for histopathology and the “ectopic tooth” was sent for CBCT (Figure 5a and b).

The submitted H and E stained section showed thickened ciliated, pseudo stratified squamous lining epithelium with goblet cells suggestive of maxillary sinus lining. The lining was hyperplastic in focal areas and supported by dense chronic inflammatory infiltrate consisting of lymphocytes and plasma cells. Abundant dilated and engorged blood vessels with hyperemia were seen in the connective tissue (Figure 5).

CBCT revealed that it was in fact a stone like structure and not a tooth (Figure 6).

## DISCUSSION

Foreign body of dental origin. The typical bodies described are: dental implants and dental roots.<sup>10</sup> However, in this case the suspected foreign body was an ectopic tooth.<sup>11</sup> Foreign bodies into the maxillary sinus may cause infectious complications due to the contact of the foreign body with the mucosa of the sinus interior, mainly, acute or chronic sinusitis.<sup>12</sup> The X-rays revealed a radiopaque foreign body in the maxillary sinus with repeated episodes of sinusitis and the X-ray giving images of chronic sinusitis.

The Caldwell Luc approach was used to locate and remove the foreign body however after biopsy was consistent with a foreign body and was consistent with a stone and not an ectopic tooth. The best treatment option to remove displaced implants into the maxillary sinus is the functional endoscopic sinus surgery.<sup>13</sup> The advantage of this surgery apart from removal of the displaced implant from the maxillary sinus is the creation of adequate patency from the natural maxillary ostium.<sup>14</sup>

However, in this case FESS was attempted twice before and the foreign body still was in the maxillary sinus so we decided to take this surgical approach.<sup>15</sup> The surgical site healed uneventfully and the primary complaints of the patient were resolved.<sup>16</sup>

## CONCLUSION

Foreign bodies may consist of various substances such as dental implants, tooth roots, wooden sticks, toothpicks, needles, plastic, glass, metal, and bullets. These are usually detected when a patient has unexplained rhinosinusitis, or as an accidental finding during radiological examination. If the foreign body was not removed from the sinus, it can lead to serious complications such as sinusitis, inflammatory reactions, and fungal infections.

The mechanism of sinusitis caused by foreign bodies is not known. It has been suggested that foreign bodies can lead

to ciliary insufficiency by causing tissue reaction and producing chronic irritation of the mucosa.

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