

# CSF Leak Following Extraction Of A Long-Standing Fronto-Orbital Bullet: A Case Report

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## Abstract

Foreign bodies of all kinds have been described in most parts of the body. In spite of its vulnerable location, the frontal sinus is not a frequent site of lodgment of foreign bodies<sup>1,2</sup>. We report a case of a foreign body (bullet) lodged in the floor of the frontal sinus lying there for five years. The removal was associated with an intraoperative cerebrospinal fluid leak that was repaired.

## INTRODUCTION

Although, a number of case reports of foreign bodies in the maxillary sinus<sup>3,4,5</sup> have been reported, fronto-orbital foreign bodies have been rare. The various foreign bodies reported in the frontal sinus include stone<sup>6</sup>, glass particles<sup>7</sup>, gunshot pellets<sup>8</sup> and other metallic foreign bodies<sup>9</sup>. In most of the instances, the foreign bodies were identified and removed at the time of their lodgment, but reports of chronic asymptomatic foreign bodies have been rarely reported<sup>10,11</sup>. This is one such case report.

## CASE REPORT

A 40-year-old male, who was a jail inmate was referred to E.N.T. out patient department of Lok Nayak hospital in April, 2004 with the complaints of occasional pain involving the right hemicranium and orbit for the last two months. There were no aggravating or relieving factors and it used to subside on analgesics. The patient was in prison on account of a criminal case in which he received a bullet injury on his right forehead around 5 years back. The bullet was fired from a short distance with a country-made pistol. There is no history of any loss of consciousness at the time of injury. The patient was asymptomatic until two months from his presentation, when he started having symptoms. The patient gives no history suggestive of any cerebrospinal fluid leak. The presence of bullet was confirmed on a plain X-ray at the time of injury, but, as the patient was asymptomatic, no consultation in this regard was sought. On examination, a part of the bullet could be palpated subcutaneously at the medial half of the roof of right orbit with puckering and scarring of overlying skin (figure 1).

## Figure 1

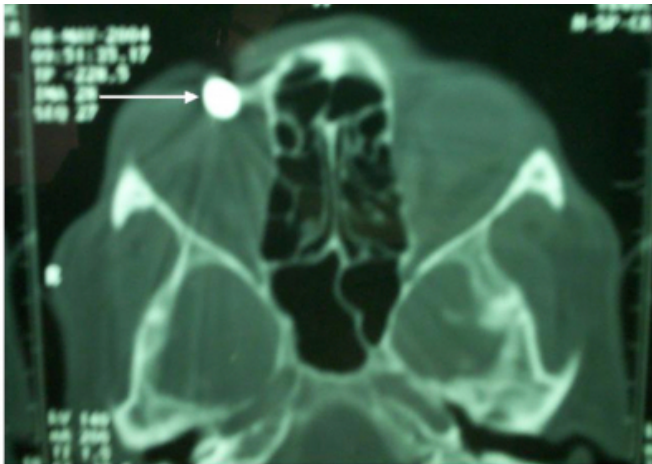
Figure 1: Part of bullet palpable subcutaneously (black arrow)



A computerized tomographic scan of the skull revealed a metallic foreign body in the floor of right frontal sinus extending till the posterior wall with soft tissue thickening lateral to the foreign body (figures 2 and 3).

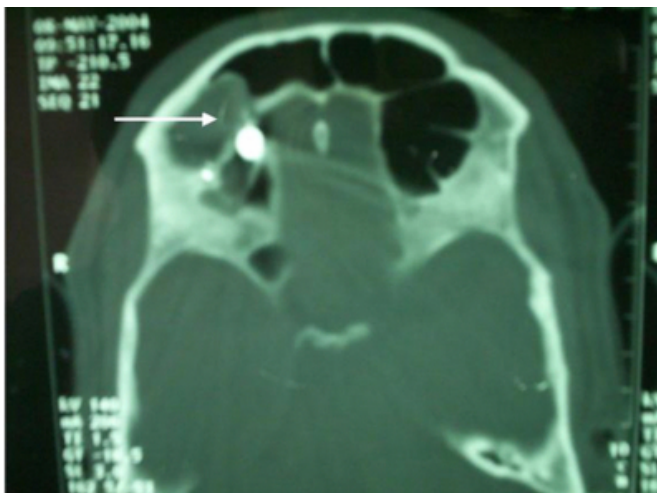
**Figure 2**

Figure 2: Bullet in the frontal sinus (White Arrow)



**Figure 3**

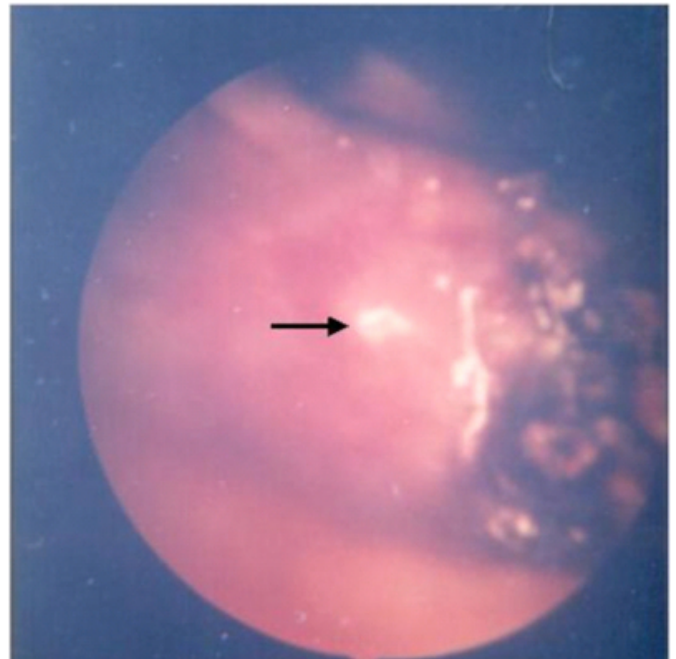
Figure 3: Soft tissue shadow lateral to the bullet (White arrow)



The foreign body was removed under general anaesthesia. An elliptical bone-deep skin incision was given around the palpable anterior end of the foreign body. The bullet was mobilized and removed after widening the bony defect in the anterior wall and floor of the frontal sinus. The sinus mucosa around the bullet was found to be edematous with pus and granulation tissue filling the lateral half of the sinus extending till the posterior wall. During the removal of the granulations, a part of the already thinned out posterior wall of the sinus was breached with resultant leak of cerebrospinal fluid (figure 4).

**Figure 4**

Figure 4: Defect in posterior wall of frontal sinus with CSF leak (Black arrow)



It was repaired using temporalis fascia and muscle harvested from his right temporal region. There was no leak postoperatively.

## DISCUSSION

The present case is interesting in many ways. Firstly, a bullet fired from a short range just managed to lodge in the air filled cavity of the frontal sinus without any intracranial extension.

Secondly, the patient has been asymptomatic for almost 5 years with the bullet retained in the frontal sinus with no evidence of infection or a foreign body reaction all these years.

Thirdly, the patient became symptomatic after such a long asymptomatic period with, complaints of right hemicranial and orbital pain. The presence of unhealthy granulation tissue and edematous mucosa justified his symptoms.

A similar case report of a retained foreign body in the frontal sinus with late onset symptoms has been reported in the past<sup>12</sup>. But, in this case, the foreign body was a piece of glass and the patient began to develop intermittent headache within 4 months of the lodgment of the foreign body.

At the time of surgery, the posterior wall of the frontal sinus was markedly thinned out and lined with granulation tissue

as a result of the underlying inflammatory process due to the retained bullet. This would suggest that there was a good likelihood of a breach in the posterior wall of the sinus due to inflammatory process per se, if the inflammation persisted with further retention of the bullet.

There is a high risk of developing a cerebrospinal fluid leak in such cases with long standing foreign bodies as a result of chronic inflammation. This must never be overlooked and the surgeon must plan the surgery in a way that he has options available at hand in case a leak results.

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