

**REMOVAL OF DIFFERENT FOREIGN BODIES FROM MAXILLOFACIAL REGION- A  
CASE SERIES**

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**ABSTRACT**

**Background:** Oral and maxillofacial region is a very prominent area of human body and is actively involved in different body functions. Foreign bodies may get penetrated in this region during function, professional working, traumatic assaults, inter-personal violence, falls, self-inflicted injuries or iatrogenically during maxillofacial surgical procedure. **Objective:** To present wide variety of foreign body's invasion in maxillofacial region, their exact localization and challenges encountered during their surgical removal. **Methodology:** The patients with history of foreign body invasion presenting to Out Patient Departments of Oral and Maxillofacial Surgery Units of de'Montmorency College of Dentistry Lahore and Nishtar Institute of Dentistry Multan were selected. A structured proforma was used to record patient's demographic data, type of foreign body and its clinical and radiographic presentation. Patients were selected for surgical removal of foreign bodies after complete assessment and exact localization of foreign body. **Results:** Of the total 48 patients, 75% were male and 25% female patients. The foreign bodies due gunshot injuries were the most common (29.16%) followed by broken osteosynthesis material (22.92%). Plain radiographs are most commonly used for assessment of foreign bodies. CT scan is a very useful imaging tool for three dimensional assessment of foreign bodied in maxillofacial region. **Conclusion:** The foreign bodies if superficially located may be easily palpable and can be removed easily under local anaesthesia. Deeply penetrated foreign bodies need meticulous radiographic assessment for proper localization and their retrieval from oral and maxillofacial region require different types of surgical techniques under general anaesthesia.

**KEYWORDS:** Maxillofacial region, foreign bodies, shot gun pellets, bullet.

**INTRODUCTION**

Foreign bodies are often encountered in the oral and maxillofacial region.<sup>[1]</sup> In medical terms, a foreign body is something that is in the body but does not belong there.<sup>[2,3]</sup> The foreign bodies which may be encountered in oral and maxillofacial region include tooth brush or its bristles, metallic wire piece, shotgun pellets, firearm bullets, glass pieces, wooden sticks, osteosynthesis plates or screws, orthodontic brackets/buttons, restorative

materials, plastic particles, stones, pins, button batteries, toy parts, broken surgical knife, surgical burs, broken coupland elevator/periosteal elevator etc.<sup>[4-8]</sup> The size, shape, type, location and composition of foreign object, its anatomical relationship to vital structures, difficult access and complexity of maxillofacial region may present challenge to the surgeon for its removal.<sup>[1,2,9]</sup> When a foreign object accidentally penetrates the facial region, it may lodge in an air-filled space, soft tissues or

between bones and muscles.<sup>[4,10]</sup> These foreign bodies may be a source of persistent pain, recurrent infection, pus discharge, foreign body reaction, swelling, chronic irritation, neurosensory deficit or difficulty in chewing and mastication and disfiguring fibrosis because they are usually dirty and carry many micro-organisms.<sup>[2,11-13]</sup> Conventional plain radiographs (Periapical view, upper and lower occlusal view, OPG, P/A face, PNS view), xeroradiographs, CT Scan, ultrasonography, electromagnetic metal detector and MRI are used for detecting such foreign bodies.<sup>[4,11-14]</sup> The most important part of diagnosis and treatment of a foreign body is accurately identifying its nature and exact localization.<sup>[4,11-15]</sup>

The current study is focused on the variety of different foreign bodies encountered in maxillofacial region and their retrieval by different surgical techniques. This study will not only contribute great knowledge and information about different type of foreign bodies that may be penetrated in oral and maxillofacial region but also the challenges encountered while their exact three dimensional localization and their surgical retrieval also.

#### PATIENTS AND METHODS

This prospective clinical case series was conducted at two public sector dental institutions of Punjab province of Pakistan i.e. Nishtar Institute of Dentistry Multan and de'Montmorency College of Dentistry Lahore from October 2015 to September 2017. Ethical approval was taken from ethical committees of the institutions. Patients of both genders and any age range, with history of foreign body invasion, presenting to Out Patient Departments of Oral and maxillofacial Surgery Units of these institutions were included in the study. The assessment of patients was done by detailed relevant history, clinical and radiographic examination. The presence of foreign object was assessed by intra-oral and extra oral clinical evaluation and its exact localization was done by different radiographic projections and CT Scan views. A written informed consent from every patient was taken after explaining risks and benefits of removal of foreign bodies. A structured questionnaire was used to record all the data e.g. patient's demographics, presenting complaint, predisposing factors to foreign body invasion, type of foreign body, its exact localization in maxillofacial region and treatment options. All the data were collected and entered in IBM SPSS version 21 and analyzed through its statistical package. Frequency distributions and percentages for all the variables were worked out and results were analyzed and presented in tables accordingly. Mean and standard deviation (mean±SD) were calculated for age of patients. Frequency and percentages were calculated for age, gender, presenting complaints and predisposing factors. Chi-square test was applied to compare predisposing factors, type of foreign body, its exact location and treatment option in male and female patients. P value  $\leq 0.05$  was considered significant.

#### RESULTS

A total of 48 patients presented to Out Patient Departments of Oral and Maxillofacial Surgery Units of de'Montmorency College of Dentistry Lahore and Nishtar Institute of Dentistry Multan were selected with different type of foreign objects in maxillofacial region. The male/female ratio of patients in current study was 3:1.

**Table 1: Gender distribution of patients.**

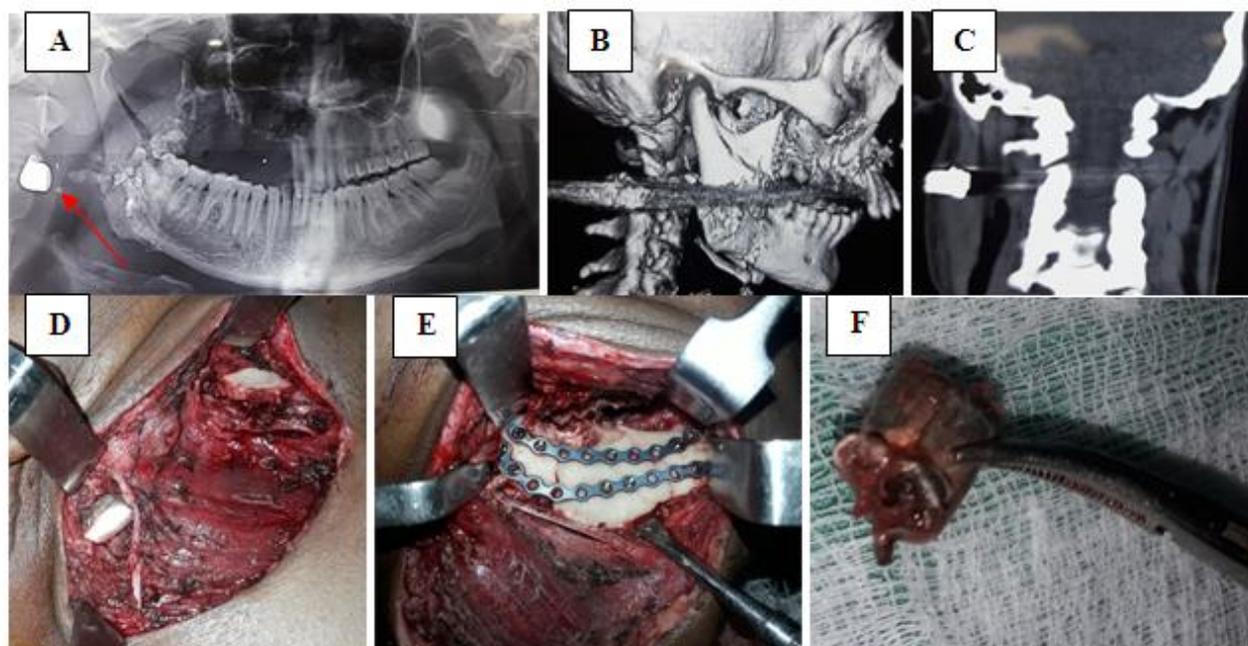
Gender	Frequency	Percentage
Male	36	75
Female	12	25

The age ranged from 5 to 55 years with a mean ( $\pm$ SD) age of 27.67 $\pm$ 12.94 years. Most of the patients were from third and fourth decade of life.

**Table 2: Age distribution of patients.**

Age (Years)	Frequency	Percentage
5-15	11	22.91
16-25	9	18.75
26-35	13	27.08
36-45	10	20.83
46-55	5	10.41

Lower face and midface was commonly involved with respect to invasion of foreign bodies followed by submandibular, submental and infratemporal region. Upper face was rarely involved in the current study. In majority of the patients, foreign bodies were removed under general anaesthesia (66.67%) and some of them were done under local anaesthesia (22.92%) or no anaesthesia (10.42%). In most of the cases surgical intervention was done only to remove the foreign body but in case of gunshot injuries mostly there were also maxillofacial fractures and the firearm bullets or shot gun pellets were removed while managing the traumatic injuries of the patients (Fig. 1).



**Fig. 1:** A. Pre-op panoramic view showing the bullet (red arrow). B. Pre-op 3-D Reconstruction CT Scan of Face. C. Pre-op coronal view of CT Scan. D. Intra-operative view of firearm bullet. E. Reduction and Fixation of Fracture. F. Removed bullet.

Relative frequency and percentages of different types of foreign bodies retrieved from oral and maxillofacial

region of study population and type of anaesthesia used are presented in Table 3.

**Table 3: Distribution of foreign bodies removed and type of anaesthesia.**

Foreign Bodies	No. of patients	Percentage	Type of Anaesthesia
Glass pieces	2	4.16	General
Displaced tooth/root	5	10.42	General
Toothbrushes	2	4.16	General
Broken needles	2	4.16	General
Firearm bullets/pellets	14	29.16	General
Osteosynthesis plates/screws/wires	11	22.92	General/Local
Wood splinters/sticks	2	4.16	Local
Broken burs	2	4.16	Local
Restorative materials	2	4.16	Local
Plastic object/piece	1	2.08	Local
Fish bones	1	2.08	No Anaesthesia
Maggots	4	8.33	No Anaesthesia
<b>Total</b>	<b>48</b>	<b>100</b>	

## DISCUSSION

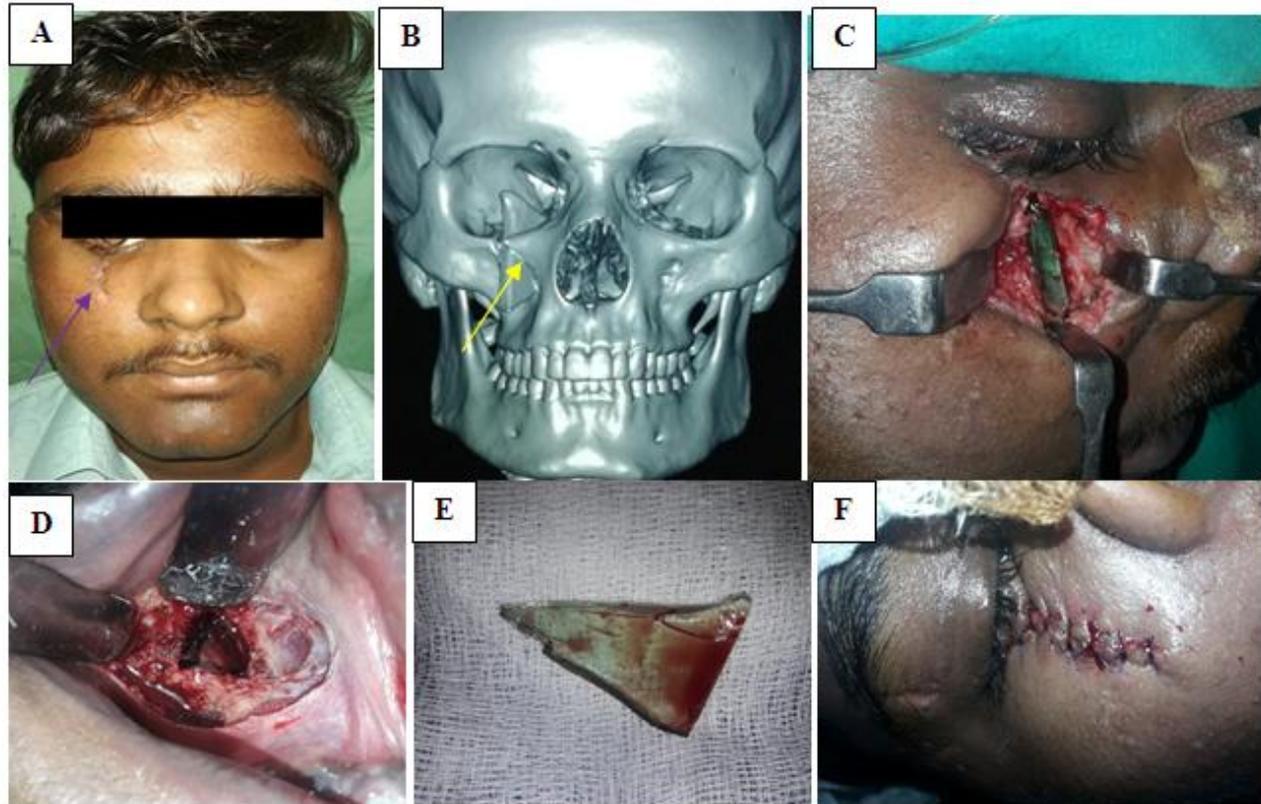
Nishtar Institute of Dentistry Multan and de'Montmorency College of Dentistry Lahore are two well renowned public sector dental institutions in the Punjab Province of Pakistan and cater the patients from all over the Punjab and adjacent areas of Sindh, Baluchistan and KPK provinces of Pakistan. So, the patients presented in these institutions with different foreign bodies in maxillofacial region had a wide variety of clinical and radiographic presentation.

The literature search in PubMed revealed mostly the case reports about the foreign bodies.<sup>[16]</sup> Only a few case series (the largest being of sixteen cases) have been

reported about foreign bodies removal in oral and maxillofacial region till now.<sup>[12]</sup> To the best of our knowledge, the current study presents the largest case series of forty eight patients of different types of foreign bodies removal from oral and maxillofacial region. In the current study, age range of patients was 5 to 55 years and more male predilection. These findings of current study are not in accordance with study conducted on Turkish population possibly due to the fact that they have more patients of invaded restorative material assessed by panoramic view and not of the surgical removal of foreign bodies. In our study, there were more patients of gunshot injuries and of traumatic injuries which are relatively more common in male population.<sup>[14,17]</sup>

In the current study, glass pieces were removed from mid-facial region of the patients who were associated with glass work. In one patient, glass piece was deeply embedded in the floor of orbit but fortunately the vision of patient was intact. The glass piece was removed

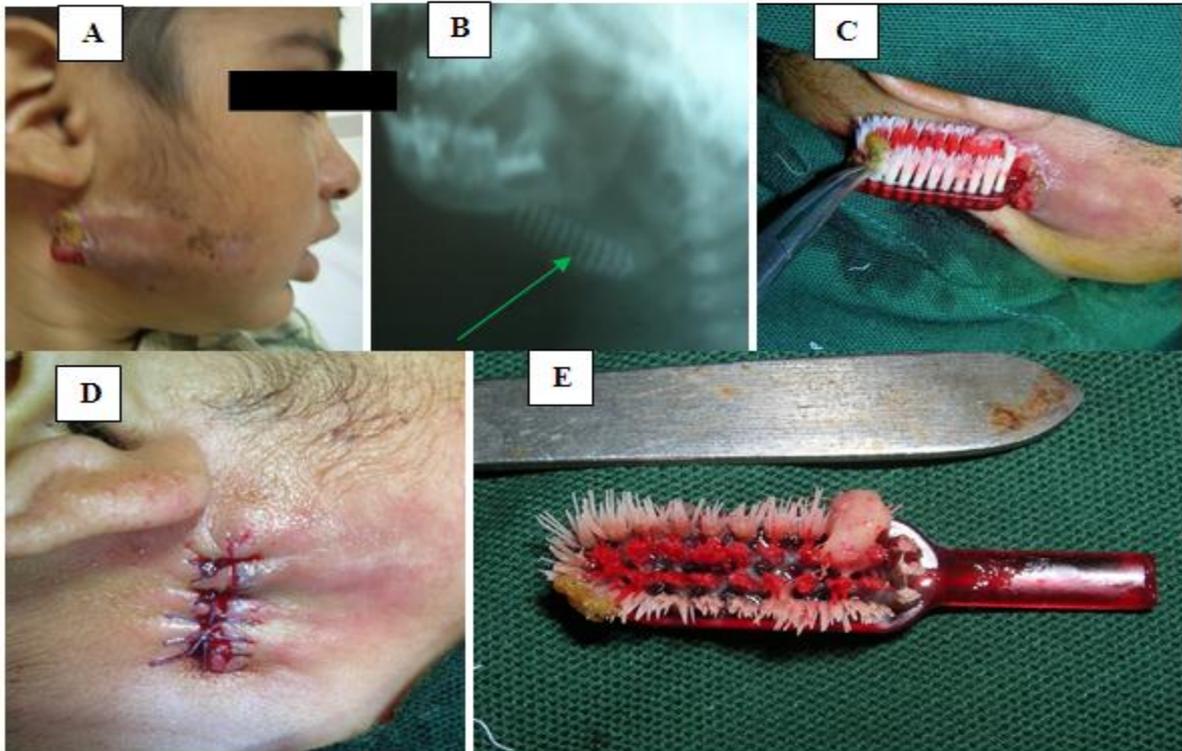
through combined intraoral maxillary vestibular approach and extraoral existing laceration (Fig. 2). The procedure was in consistent with an Indian case report where 16 glass particles had been removed from single patient through existing laceration.<sup>[18]</sup>



**Fig. 2:** A. Pre-op patient with entry scar (blue arrow). B. CT Scan, 3-D Reconstruction of face showing glass piece (yellow arrow). C. Extra-oral view of glass piece. D. Intra-oral view of glass piece. E. Glass piece removed. F. Post-op sutured wound.

Four patients with displaced teeth had previous history of traumatic tooth extraction. Among these, two patients had maxillary third molar displaced into infratemporal fossa and were managed via intra-oral approach. Two patients had root of maxillary first molars displaced into maxillary sinus and were managed via Caldwell Luc operation. In one patient, with severe maxillofacial trauma, right mandibular molar tooth was displaced in submasseteric space from where it was removed during reduction and fixation of fractures. These findings of the current study are in accordance with the current literature.<sup>[19,20,21]</sup>

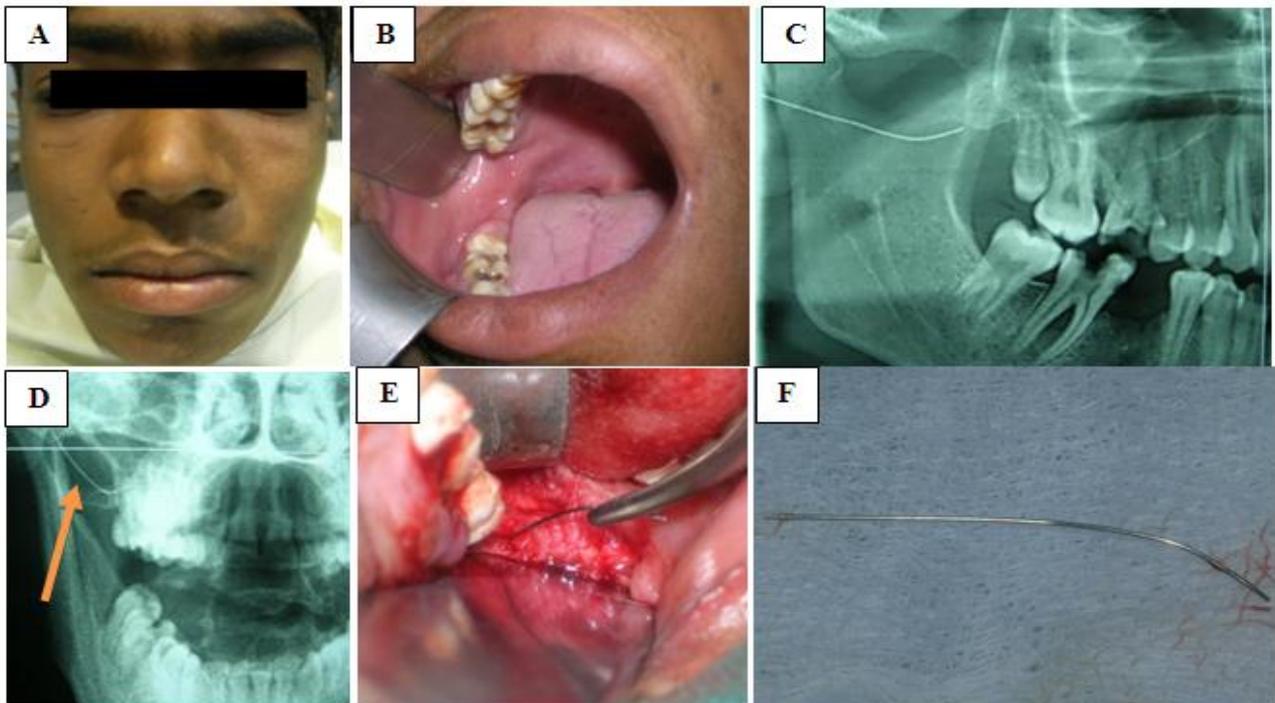
Toothbrushes were removed from two children who have pushed the brush heads in buccal soft tissue (Fig. 3).



**Fig. 3: A. Pre-op patient. B. Radiograph showing toothbrush (green arrow). C. Intra-operative view of toothbrush removal. D. Post op sutured wound. E. Removed toothbrush.**

Broken local anaesthesia needles were removed from pterygomandibular spaces of patients with history of local anaesthesia injections for dental procedures (Fig. 4). Majority of the patients with history of firearm injury also had maxillofacial fractures. In these patients bullets

were removed as part of surgical procedure for reduction and fixation of facial fractures. The shotgun pellets were only removed when these were easily accessible to avoid undue soft tissue exploration and damage to vital structures.

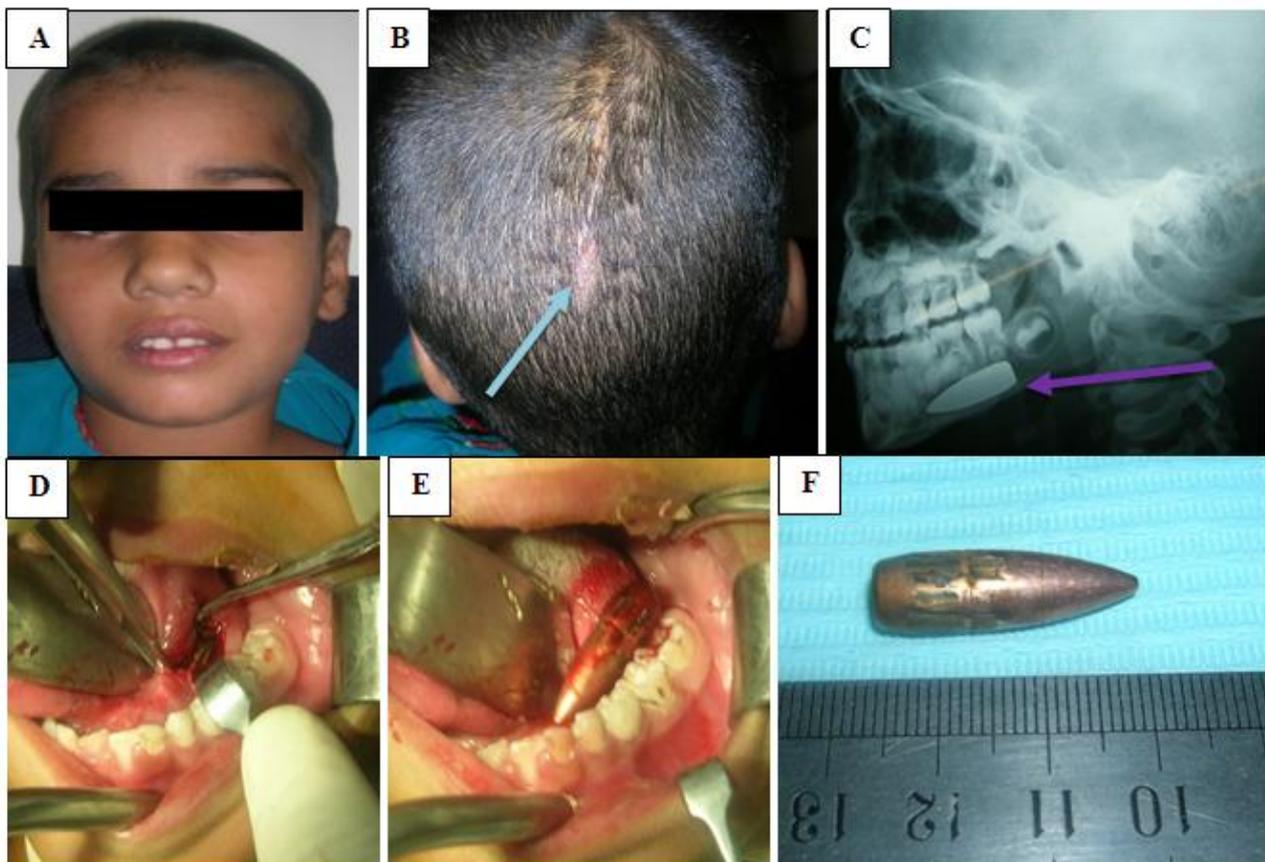


**Fig. 4: A. Pre-op patient. B. Intra-oral view. C. Panoramic view. D. Frontal view showing metallic foreign body (orange arrow). E. Intra-operative view. F. Removed needle.**

Osteosynthesis plates were removed only in case of plate fracture, plate exposure, infection and screw loosening. In the current study, most of the foreign bodies retrieved were metallic (64.58) as compared to non-metallic objects (35.42%). These findings are also in consistent with many of the international studies (Fig. 5).<sup>[22-25]</sup>

In one patient penetrated wooden toothpick stick was removed from palatal area while in the other patient, with history of trauma, small wooden piece was removed from floor of mouth region. The patients with broken fissure burs had history of mandibular third molar removal by some general dental surgeons. These patients presented with continuous dull pain in associated area. In

one patient, broken tip of bur along with associated fibrotic tissue was removed under local anaesthesia. The prime issue with such foreign bodies is exact localization while surgical exploration during removal.<sup>[22,23]</sup> Displaced amalgam filling material was removed in two patients. These patients presented with maxillofacial injuries and dislodgement of fractured teeth segments and filling material in lacerated soft tissue of oro-facial region.<sup>[24,25]</sup> Fish bone was removed in one patient from gingival tissue and plastic piece in one patient from right maxillary region. Maggots were removed from wounds of two patients with osteomyelitis and other two with recurrent oral squamous cell carcinoma.<sup>[26,27]</sup>



**Fig. 5: A. Pre-op patient. B. Entry wound of bullet (sky blue arrow). C. Radiograph showing the bullet (dark blue arrow). D. Intra-oral view. E. Intra-operatively while bullet removal. F. Removed bullet.**

After one year of follow up, the complaints of all the patients related to foreign bodies had resolved, function was restored, and esthetics improved significantly without complications. The two patients with recurrent oral squamous cell carcinoma died of the recurrent disease during follow up.

#### CONCLUSION AND RECOMMENDATIONS

Foreign bodies can be left untreated if these are completely asymptomatic but should always be removed if palpable, symptomatic or in vicinity of vital structures or if surgical procedure is required for management of other injuries. Computerized tomography is the gold

standard for detection of foreign bodies because of the creation of a 3-dimensional image. Blind exploration for removal of foreign body is time consuming and futile. So, exact localization of deeply invaded foreign bodies in maxillofacial region and proper surgical technique is must for their removal so as to prevent damage to adjacent structures and other undue complications.

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