

## Case Report

# Fronto-parietal Osteomyelitis managed by Bipedicled Bucket Handle scalp flap

Pawan K. Dixit\*, Divya Narain Upadhyay

Department of Plastic Surgery, King George Medical University, Lucknow, Uttar Pradesh, India

**Received:** 19 March 2018

**Accepted:** 27 April 2018

**\*Correspondence:**

Dr. Pawan K Dixit,

E-mail: [sine.pkd@gmail.com](mailto:sine.pkd@gmail.com)

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### ABSTRACT

Osteomyelitis of skull is rare clinical entity in today's world. Mortality from complications from skull osteomyelitis is 20-40 %. We report a 60-year-old patient presented with fronto-parietal osteomyelitis with orbital extension, with known cardiac and pulmonary disease. Large bipedicled bucket handle flap was used for soft tissue reconstruction. Though free flap reconstruction is ideal for large scalp defect, it requires technical expertise and patient's fitness for surgery. Bipedicled bucket handle flap can be successfully used for large scalp defect reconstruction in patients in which free flap reconstruction is not possible.

**Keywords:** Bipedicled scalp flap, Bucket handle scalp flap, Osteomyelitis skull

### INTRODUCTION

Osteomyelitis of the skull is a rare clinical presentation in today's era owing to advances in surgical techniques and antibiotic therapy. It may sometimes occur after trauma or neurosurgical procedures or may occur as a complication of conditions which predisposes the host to infection, such as systemic sepsis or multiple pyaemic/pyogenic abscesses.<sup>1</sup>

Bacterial invasion in the bone causes oedema and inflammation, subsequently leading to compression of blood vessels. Vascular compromise leads to ischemia and necrosis of bone leading to bone and soft tissue defects.<sup>2</sup>

Though whereas bone defects usually require bone grafting, autologous or vascularized, soft tissue defects can be managed by local muscle or skin flaps or vascularized free flaps. Therefore, here we report a case of fronto-parietal osteomyelitis which was managed through a bipedicled bucket handle scalp flap used for

wound cover following excision of necrotic bone and other soft tissue.<sup>3</sup>

### CASE REPORT

A 60 years old male patient presented to the Plastic Surgery outpatient department with complains of pus discharge from scalp and right supra-orbital area for the last six months and loss of vision in the right eye. The patient gave history of an episode of eruptions over the right side of face, forehead and right eye, four years back.

This was followed by redness and swelling in right eye, history of purulent discharge and reduced vision in right eye. The swelling and redness gradually spread to the forehead, leading to wounds at bilateral frontoparietal areas, for which debridement, followed later by split skin grafting had been done at another institution earlier.

Patient was a known case of chronic obstructive pulmonary disease and cardiac disease.

**Clinical Examination**

Clinical examination revealed a skin grafted fronto-parietal area extending from the supra-orbital ridges to the coronal sutures bilaterally. The skin graft was adhered to the underlying calvarium. Anteriorly over the right frontal area there was a depression with an area of wound with underlying exposed bone. There were also several sinuses in the right frontal/supra-orbital area with purulent discharge from these. The depression with exposed bone measured nearly 5X5 cms (Figure 1a). There was pus discharge from right supra-orbital area and right malar eminence (Figure 1b).

The right cornea was opaque and there was no perception of light in the right eye. The right upper lid had ectropion and right eyebrow had been lost. Both superficial temporal arteries were palpable. General and systemic examinations were otherwise unremarkable.

A clinical diagnosis of osteomyelitis of frontal bones of both sides was made and a CT Scan of the face was ordered.



**Figure 1: External view a) Exposed bone over right frontoparietal scalp with previously skin grafted fronto-parietal area. b) Pus discharge from right orbit and malar prominence (shown with arrows).**

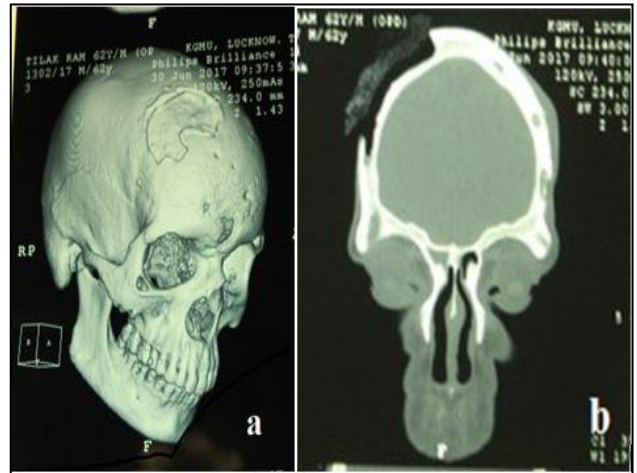
**Radiological investigations**

*3D CT Scan face*

The CT Scan showed a well-defined osteolytic lesion with sclerotic margins in right malar prominence with extension into lateral wall of right orbit. The right frontal bone also showed moth-eaten appearance and the outer table of the calvarium was absent over a significant area of the right calvarium. (Figure 2a, 2b)

A diagnosis of osteomyelitis of the right frontal bone and right zygomatico-orbital complex was made, and the

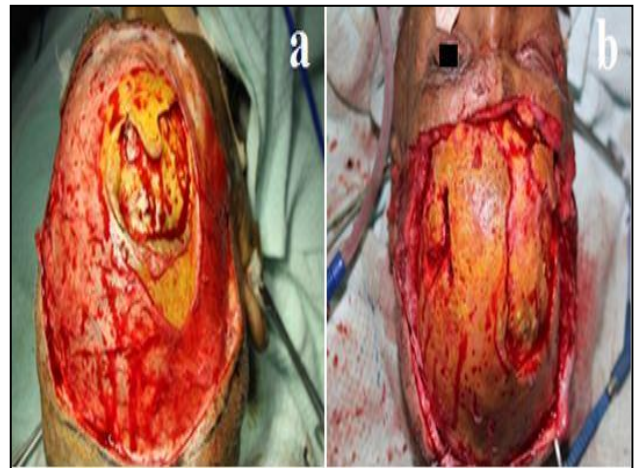
patient was planned for excision of dead bone along with vascularised flap cover.



**Figure 2: a) Osteolytic lesion with sclerotic margins in right malar prominence with extension into lateral wall of right orbit. b) Area of osteomyelitic right frontal bone.**

**Surgical Management**

The surgical procedure was done under general anaesthesia. Patient was kept in supine posture. Excision of previously skin graft over the fronto-parietal area was done (Figure 3a) along with debridement craniectomy of outer table of right fronto-parietal bone. Curettage of the sinuses over the right maxillary and right orbital area and lavage was done (Figure 3b).



**Figure 3: Intraoperative pictures a) Excision of previously skin grafted fronto-parietal area. b) Debridement craniectomy of outer table of right fronto-parietal bone.**

Skin defect after debridement of the dead bone and old skin graft over the fronto-parietal area was measured to be 28 x 18 cms. in fronto-temporo-parietal area. Parietal branch of superficial temporal arteries on both sides were

traced and marked by hand held Doppler. Flap marking was done for bipediced parieto-occipital flap based on bilateral superficial temporal artery and bilateral post auricular arteries.

Flap was elevated in subgaleal plane and advanced to close the defect like "Bucket handle". Donor area was covered with split thickness graft. Right upper eye lid ectropion release was done which was covered by split thickness skin graft. Postoperative period was uneventful. Post-curettage wound inferior to right orbit healed with secondary intention.



**Figure 4: Post-operative view a) Left lateral b) Right Lateral.**

## DISCUSSION

There is very low prevalence of osteomyelitis of the skull, after the introduction of broad spectrum antibiotics but mortality from complications is 20%-40%. Our patient was a case of Fronto-parietal Osteomyelitis, occurring post herpes zoster infection. Herpes Zoster has already been reported to be causing central craniofacial infections.<sup>5</sup>

Proper management of osteomyelitis requires the use of functional imaging of craniofacial skeleton.<sup>6</sup> We got the 3D CT scan done which was suggestive of chronic osteomyelitis of right malar eminence with sinus formation. Management of chronic osteomyelitis includes debridement of dead tissue and reconstruction as per requirement.

In this patient defect involved the frontoparietal region of scalp with a large soft tissue defect of 28x18 cm after debridement which we planned to cover with a local bipediced flap. Since inner table of skull bone was not involved, there was no need of bony reconstruction. We planned bipedicle scalp flap based on B/L temporal arteries to cover the large defect of 28 x 18 cm over scalp.

Kim JC et al reported a series of 5 patients in which bucket handle flap was done for upper lip and scalp defects with good results.<sup>7</sup> Paul Ket al managed a case of

postelectric burn temporal defect by bipedicle scalp flap based on B/L temporal arteries.<sup>8</sup> Lu Y et al reported a series of 24 patients with osteomyelitis of skull. After debridement of necrotic tissue, soft tissue defects were managed with adjacent scalp flap in 12 cases, trapezius myocutaneous flap in 6 cases, and free anterolateral thigh flap in 6 cases.<sup>9</sup>

Masood Motasaddi Zaranday used bipedicle scalp flap based on B/L temporal arteries for reconstruction of lower lip and chin in two male patients with lower lip carcinoma with good aesthetic result.<sup>10</sup>

Microvascular free flap reconstruction is ideal reconstruction in these type of scenarios, but it requires technical expertise, patient's fitness for long duration of surgery. This patient was not an ideal candidate for free flap reconstruction because of fitness issues. Further surgeries will be required for improvement in appearance.

## CONCLUSION

In patients with chronic osteomyelitis, thorough debridement of infected and necrotic foci is essential. Large scalp defect can be covered with bipedicle scalp flap with satisfactory result.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: Not required*

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**Cite this article as:** Dixit PK, Upadhyay DN. Fronto-parietal Osteomyelitis managed by Bipedicled Bucket Handle scalp flap. *Int Surg J* 2018;5:2367-70.