

## Introduction

A review of the **last four years of OPAT data** was carried out to determine the extent of **Skull Osteomyelitis including Skull Base Osteomyelitis (SBO)** in our patient cohort. Skull osteomyelitis and SBO are rare conditions, which pose both diagnostic and treatment challenges for the physician. We aimed to further characterise this population. We identified five cases under the care of the Infectious Disease Department in Beaumont Hospital.

## Skull Base Osteomyelitis

Three cases were identified, **all in males over the age of 80.**

**Risk factors:** One patient had a history of nasopharyngeal carcinoma treated with chemo-radiotherapy. There were no clear risk factors for the other two cases (e.g. no documented otitis externa)

**Presentation:** Two of the cases presented acutely with **pyrexia, pain and in one case facial nerve palsy.** The other case was detected incidentally on CT.

**Imaging:** MRI was performed in all cases. **Radiology was only deemed highly suggestive of SBO in one instance,** with the differential in the other cases favouring **nasopharyngeal malignancies** → in keeping with the well documented **diagnostic challenge associated with SBO.** Surgical biopsies were performed.

**Critical specimen → 100% of cases**

One case grew **MSSA** and was managed with flucloxacillin. The other two cases had more complicated growth patterns including **pseudomonas** and required prolonged OPAT with piperacillin-tazobactam. **Surgical intervention was not pursued** as a treatment strategy in any case.

## Post-operative Cohort

Two cases were identified, both in females **under the age of 50.**

**Risk factors:** . Both patients had a **history of major cancer surgery** with complex skull reconstruction

**Presentation:** Symptoms consistent with infection, including **pain, erythema and fever.**

**Imaging:** MRI imaging favoured osteomyelitis however osteonecrosis secondary to radiation was also considered.

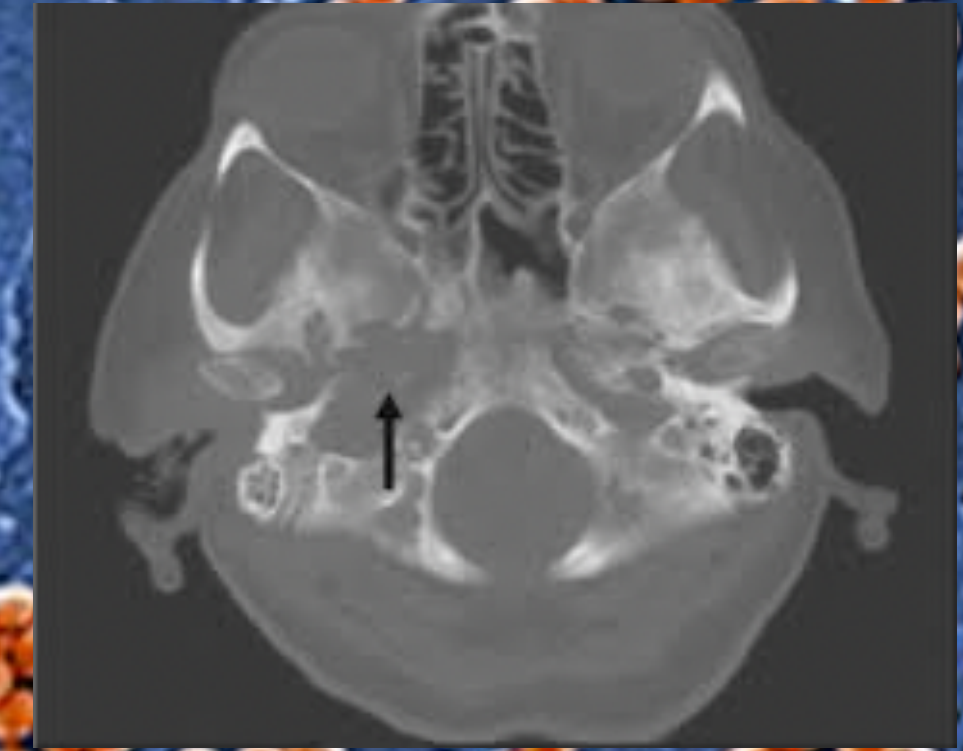
**Critical specimen → 100% cases.**

One case demonstrated heavy growth of **MSSA** and moderate growth of **anaerobes** from a scalp biopsy. This was treated with a prolonged course of **ceftriaxone** and **metronidazole** prior to oral switch to flucloxacillin and metronidazole. **Hyperbaric oxygen therapy** was used as an adjuvant therapy. The second patient cultured **MSSA** from critical specimens. After surgical re-intervention **pseudomonas aeruginosa, staphylococcus epidermidis and candida albicans** were isolated with resistance patterns requiring prolonged treatment with **meropenem, daptomycin and oral fluconazole.**

## Anatomy of the skull base

The Skull base has a complex anatomy consisting of the **frontal, temporal, occipital, ethmoid and sphenoid bones.** The skull base has numerous foramina and channels that are crossed by important neurovascular bundles. Damage to the bone by infection can cause damage to these structures.

**Imaging is often non-specific** in the diagnosis of SBO, hence the importance of critical specimens and appropriate clinical history and exam.



Patient Group	Predominant isolate(s)	Treatment
1) Post-operative	<i>MSSA, moderate growth anaerobes</i>	Ceftriaxone and Metronidazole
2) Post-operative	<i>pseudomonas aeruginosa, staphylococcus epidermis, candida albicans</i>	Meropenem, Daptomycin, oral Fluconazole
3) Skull base Osteomyelitis	<i>MSSA</i>	Flucloxacillin
4) Skull base osteomyelitis	<i>pseudomonas aeruginosa</i>	Piperacillin/tazobactam
5) Skull Base osteomyelitis	<i>pseudomonas aeruginosa</i>	Piperacillin/tazobactam

## Conclusion

We identified **two subgroups in our Skull Osteomyelitis** population. Skull osteomyelitis related to surgery tended to occur in younger patients while SBO tended to present in older males. **Critical specimens were available in 100% of cases and were essential in tailoring antimicrobial therapy.** Consistent with the literature, *pseudomonas* and *staphylococcus aureus* were the most common pathogens causing SBO. Post-operative osteomyelitis of the skull was associated with more complicated microbiology.