



# Lingual Abscess after Posterior Fossa Surgery: An Unusual Complication of the Concorde Position

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## Abstract

### Keywords

- ▶ posterior fossa surgery
- ▶ Concorde position
- ▶ abscess
- ▶ complications

Posterior fossa tumors are one of the most common tumors occurring in children. These tumors are often operated in the Concorde or prone position. Venous congestion can occur due to neck flexion during the positioning causing macroglossia. We report a case of a lingual abscess in a child after surgery in the Concorde position. There was no preoperative evidence of any lingual and dental complaints or injury during intubation. We hypothesize that the lingual abscess in the immediate postoperative period was secondary to venous stasis during the positioning for surgery.

## Introduction

Posterior fossa tumors comprise approximately 60% of intracranial tumors occurring in children.<sup>1</sup> To access the posterior fossa for surgery, the patient may have to be positioned in a lateral, prone, Concorde, or sitting position. For midline suboccipital craniotomy, the patient is usually positioned in a sitting, prone, or Concorde position. In the prone or Concorde position, the chin is kept in a “military tuck” position with the neck in moderate flexion to increase the space between the foramen magnum, and the posterior arch of the C1 vertebra. However, this can cause venous congestion due to increased flexion of the neck compromising venous return. Herein, we report a case of lingual abscess developing in a child with cerebellar pilocytic astrocytoma after surgery in the Concorde position.

## Case Report

A 15-year-old girl presented with a history of gait instability with a tendency to fall for last 6 months. Subsequently, she

developed intermittent episodes of headache along with blurring of vision for the last 3 months. On examination, she denied perception of light in both her eyes, and had ataxic gait and cerebellar signs. She had significant hydrocephalus for which a ventriculoperitoneal shunt was placed 1 month back. Magnetic resonance imaging (MRI) with contrast of her brain showed the presence of a heterogenous solid cystic space-occupying lesion in the right cerebellar hemisphere, and vermis that was iso-hypointense on T1-weighted images, and iso-hyperintense on T2-weighted images with contrast enhancement of the solid part (▶ Fig. 1A). She did not have history of seizures, stigmata of vitamin deficiency, or any dental/oral complaints preoperatively. She underwent midline suboccipital craniotomy in Concorde position, and the tumor was excised. During positioning, two fingerbreadth gap was maintained between the chin, and the sternum. There was no rise of airway pressure during positioning. She had an uneventful intubation with an armored endotracheal tube with a bite block placed orally. She was extubated after surgery and neurologically remained same as preoperatively. The total duration of

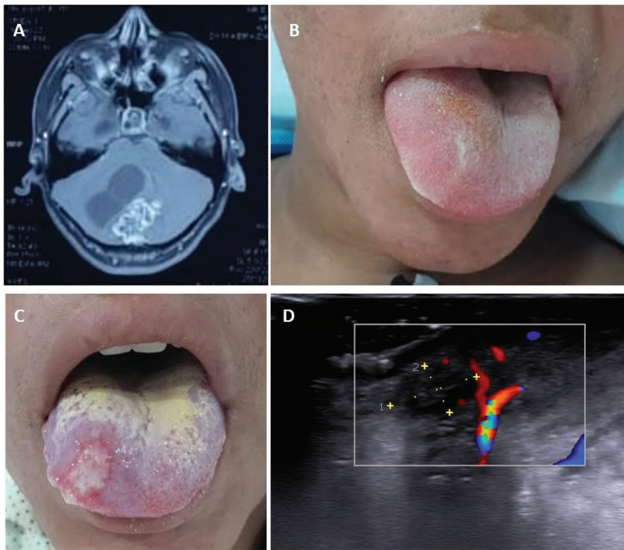
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**Fig. 1** (A) Postcontrast magnetic resonance imaging showing a solid-cystic space-occupying lesion in the right cerebellar hemisphere with contrast enhancement of the solid part. (B) Clinical photograph on postoperative day 2 showing a tender, indurated swelling on the right side of anterior third of the tongue. (C) Clinical photograph on postoperative day 4 showing the evolution of the swelling on the right side of anterior third of the tongue. (D) Ultrasonographic image of the tongue showing a well-defined hypoechoic area in the anterior third of the tongue.

surgery from incision to closure was 6 hours and 45 minutes, and the time from intubation to extubation was 7 hours and 45 minutes. She had some swelling of her lips in the postoperative period along with slight hoarseness of voice in the immediate postoperative period that subsided with steam inhalation. However, she complained of pain in the right side of her tongue on postoperative day 2. Local examination showed an area of redness and swelling on the right side in the anterior third of the tongue (►Fig. 1B). We could not find any obvious signs of injury to her tongue, and we had not used neurophysiologic monitoring during the surgery. However, small injuries to the lingual epithelium may not be obvious but can act as a site of entry of pathogens. She did not have any fever; however, her total leucocyte count was elevated. On postoperative day 4, the area in her tongue became more circumscribed with furring of the tongue (►Fig. 1C). An ultrasound examination showed a well-defined hypoechoic area within the tongue parenchyma suggestive of a lingual abscess (5.6 × 3.7 mm) (►Fig. 1D). Broad-spectrum antibiotics, and metronidazole for anaerobes were started along with oral rinsing with chlorhexidine solution. Her fever subsided on postoperative day 5 and the swelling gradually reduced. Surgical drainage was considered but the parents wanted to continue with medical management first. She responded to antibiotics, and made a full recovery. Histopathological diagnosis of the cerebellar lesion was pilocytic astrocytoma.

## Discussion

Lingual abscess occurs due to the involvement of the tongue parenchyma by an infectious process. It is a rare presentation, reported in the literature as case reports, and short case

series. Srivaniachapoom and Yata in their review of literature proposed that dysfunction of any of the protective mechanisms of the tongue like vascularity and lymphatic supply, tightness of the tongue musculature, integrity of the surface epithelium, constant tongue mobility, and continuous saliva turnover can lead to infection by a pathogenic organism giving rise to an abscess.<sup>2</sup> The offending pathogens are usually the normal flora of the oral cavity and oropharynx like *Streptococcus spp.*, *Staphylococcus spp.*, *Bacteroides*, *Fusobacterium*, and anaerobes.

Macroglossia is one of the complications of prone/Concorde position reported in literature. Various mechanisms have been proposed to explain its development. Bilateral venous obstruction due to neck flexion can lead to venous stasis as well as thrombosis of the lingual vein causing macroglossia. Venous stasis can also occur due to compression of the base of the tongue.<sup>3</sup> Another mechanism, particularly in posterior fossa surgery, is secondary to autonomic stimulation due to surgical manipulation of the brainstem.<sup>4</sup> To the best of our knowledge, no cases of lingual abscess after posterior fossa surgery have been reported in the literature.

In the present case, we believe that the development of the lingual abscess was due to venous obstruction caused while positioning the patient along with some trivial trauma that breached the surface epithelium. Immobility of the tongue and impaired turnover of saliva may also have contributed to the development of lingual abscess. The differential diagnosis of the lesion consists of a hematoma versus an abscess. On ultrasonography, they can be quite difficult to distinguish; however, a hematoma with established clot will be more hyperechoic, while an abscess will be hypoechoic with a surrounding hyperechoic border.<sup>5</sup> As noted in the case description, there was no evidence of tongue bite due to an undetected seizure, and no evidence of any injury that may have occurred during intubation.

## Conclusion

The diagnosis of lingual abscess is made by ultrasonography, contrast MRI, or contrast computed tomography along with a needle aspiration to identify the organism and determine its sensitivity. Treatment consists of initiation of broad-spectrum antibiotics along with anaerobic coverage and needle aspiration or surgical drainage of the abscess. Care must be taken to assess and maintain the airway, as lingual abscess, particularly in the posterior third of the tongue, can rapidly cause airway obstruction.<sup>2</sup>

### Consent for Publication

Written informed consent was obtained from the parents for publication.

### Authors' Contributions

All authors contributed to the study conception and design. D.D. was involved in material preparation, data collection, and analysis. M.T. contributed to radiological part of the study. D.D. wrote the first draft of the manuscript, and all authors commented on previous

versions of the manuscript. All authors read, and approved the final manuscript.

**Conflict of Interest**

None declared.

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