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Case Report

Acute Otomastoiditis in a Preterm Newborn: A Case Report

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Abstract: Otomastoiditis is a rare but severe complication of acute otitis media, particularly in infants under six months of age, where classical symptoms may be absent, leading to diagnostic and therapeutic challenges. We present the case of a preterm infant (gestational age: 31 weeks) diagnosed with acute otomastoiditis complicated by a subperiosteal abscess. The infant was initially admitted to the Kangaroo Unit due to prematurity. On the 20th day of life, the newborn presented with apnea and cyanosis. On the 21st day of hospitalization, she developed a left retroauricular swelling with erythema and tenderness. Bedside ultrasound revealed a fluid-filled area with a breach in the outer bone layer, confirming the diagnosis of a subperiosteal abscess secondary to otomastoiditis. CT findings were mastoid opacification, cortical bone erosion and subperiosteal abscess. A multidisciplinary approach was employed, including otorhinolaryngology consultation, imaging studies (cranial computed tomography), and surgical intervention. The patient underwent abscess drainage, followed by mastoidectomy and placement of a ventilation tube. Cultures yielded *Staphylococcus aureus*, guiding continued treatment with oxacillin for 21 days. The infant showed progressive clinical improvement and was discharged on the 41st day of hospitalization. This case underscores the importance of prompt identification of atypical signs of otomastoiditis in preterm infants and highlights the crucial role of surgical and targeted antibiotic therapy.

Keywords: Case Report; Otomastoiditis; Mastoidectomy; Newborn; Preterm Infant.

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1. Introduction

Acute otomastoiditis is a serious suppurative complication of acute otitis media [1]. In infancy, the mastoid antrum has anatomical characteristics that increase susceptibility to complications. Fluid can more easily become trapped in the antrum, and infection may spread by eroding the mastoid bone or via small veins, leading to osteitis [2]. The most common complication of acute otomastoiditis is subperiosteal abscess, and frequently the pathogens isolated are *Streptococcus spp* and *Staphylococcus aureus* [3, 4]. Delay in surgical treatment may result in life-threatening complications such as meningitis, brain abscess, or venous thrombosis [2]. While acute otomastoiditis is more common in infants aged 6 to 24 months, it is rare in neonates, especially in preterm infants but clinically significant due to the potential for rapid progression and severe complications [5]. Immature immune responses, anatomical factors, and prolonged hospitalizations increased susceptibility of preterm newborns for otitis media and its complications [6]. In this population, the ab-

sence of typical symptoms - such as otalgia, fever, and otorrhoea - makes diagnosis particularly challenging. Only a few cases have been reported in full-term neonates [7, 8] and, to our knowledge, none in preterm newborns. This report describes a case of neonatal otomastoiditis in a preterm infant, detailing the diagnostic approach, treatment, and outcome.

2. Case Report

A female preterm neonate was born at 31 weeks of gestation via spontaneous vaginal delivery. The Apgar scores were 8 and 9 at one and five minutes, respectively. Birth weight was 1745g and length was 40 cm. The pregnancy was uneventful, and the parents were healthy and non-consanguineous. Family history was non-contributory.

Due to prematurity and low weight, the newborn was admitted to the Kangaroo Unit; a hospital ward dedicated to implementing Kangaroo Mother Care for preterm or low-birth-weight infants, promoting skin-to-skin contact and breastfeeding instead of conventional incubator care. On day 20 of life, while exclusively breastfed, she experienced sudden apnea and cyanosis. She was promptly transferred to the neonatal intensive care unit (NICU), where blood tests revealed neutrophilia and elevated C-reactive protein. Cerebrospinal fluid collected through lumbar puncture was normal. Empirical antibiotic therapy with oxacillin and amikacin was initiated. On day 21, swelling was noted in the left retroauricular region, accompanied by erythema and tenderness (Figure 1).

Figure 1. Increased volume and hyperemia in the mastoid region of the premature newborn.

No otorrhea was present, and otoscopy was unremarkable. Ultrasound of the soft tissue revealed a fluid-filled collection measuring 3.3 x 2.0 x 1.6 cm, along with disruption

of the external cortical bone. Cranial computed tomography with contrast confirmed bilateral mastoid cell opacification, cortical bone erosion and a subperiosteal abscess. The culture of the drained fluid grew oxacillin-sensitive *Staphylococcus aureus.* Immunodeficiency screening (immunoglobulin levels, CD4+/CD8) was negative, except for low IgG. The general examination of the newborn preterm did not reveal any malformation or facial abnormalities. Abdominal ultrasound and echocardiogram were normal.

Surgical drainage of the subperiosteal abscess and mastoidectomy were performed. The patient received intravenous oxacillin for 21 days. The retroauricular swelling resolved progressively, and she was discharged in stable condition on day 41 of hospitalization. Hearing evaluation and neurodevelopmental assessment were adequate 3 months after hospital discharge and IgG level was almost normal.

3. Discussion and Conclusion

Acute otomastoiditis is an uncommon but potentially serious complication of acute otitis media, especially in neonates [1, 2]. Its occurrence in preterm infants is exceedingly rare. To our knowledge, this is the first reported case of acute otomastoiditis with a subperiosteal abscess in a preterm newborn. Few cases have been documented in full-term neonates. Lim et al. reported a four-day-old newborn who presented with otorrhea and facial paralysis and progressed to meningitis [5]. Menezes et al. [7] described an 11-day-old with acute mastoiditis and transient antibody deficiency, successfully treated with medical and surgical interventions. Both reports emphasized diagnostic challenges due to the absence of typical symptoms and highlighted the importance of early imaging.

Baljosevic et al. [2] retrospectively analyzed infants under six months with acute otomastoiditis (excluding neonates), reporting a high rate of subperiosteal abscess and absence of classical signs like fever and otorrhea. All patients recovered with combined medical and surgical management. In our case, the initial presentation included only apnea and cyanosis, followed by a retroauricular swelling, without fever or ear discharge. These nonspecific signs align with previous reports and underscore the difficulty in diagnosing otomastoiditis in neonates [5, 7]. Clinicians should maintain a high index of suspicion in preterm infants with sudden clinical deterioration.

In our patient, several factors guided the diagnostic reasoning. First, the sudden onset of apnea and cyanosis in a previously stable preterm infant raised suspicion for a systemic infectious process, besides the combination of elevated inflammatory markers (neutrophilia and C-reactive protein). Further, a localized retroauricular swelling strongly suggests mastoid involvement, despite the absence of otoscopic findings. Additionally, the observation of fluctuance on palpation and disruption of cortical bone on ultrasound suggested an abscess originating from the mastoid. This stepwise correlation between systemic deterioration, localized signs of infection, and radiologic evidence of mastoid involvement was critical in establishing the diagnosis. Early imaging studies were indispensable in confirming the extent of disease and informing the need for surgical intervention.

The pathophysiology in preterm neonates likely involves both anatomical and immunological immaturity [1]. Their underdeveloped mastoid air cell system facilitates fluid accumulation and subsequent infection. Additionally, transient immunodeficiency, such as hypogammaglobulinemia, may predispose them to progression from otitis media to mastoiditis [2]. Management requires a multidisciplinary approach [3, 4]. Our patient benefitted from early surgical drainage, mastoidectomy, and pathogen-directed antibiotic therapy. This comprehensive strategy likely contributed to her full recovery without complications. Some studies and systematic reviews have demonstrated that mastoidectomy rather than simple abscess drainage has the highest cure rates, particularly when there is evidence of cortical bone erosion [9, 10].

This case contributes to the limited literature on acute otomastoiditis in preterm neonates. It emphasizes the need for early recognition of atypical signs and the value of timely imaging and multidisciplinary care. Further research is needed to elucidate the role

of immunological factors and to optimize diagnostic and therapeutic protocols in this vulnerable population.

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References

1. Cassano P, Ciprandi G, Passali D. Acute mastoiditis in children. Acta Biomed. 2020;91(Suppl 1):54–9. doi:10.23750/abm.v91i1-S.9259.
2. Baljosevic I, Mircetic N, Subarevic V, Markovic G. Acute mastoiditis in infants. Eur Arch Otorhinolaryngol. 2006;263:906–9. doi:10.1007/s00405-006-0085-z.
3. Zanetti D, Nassif N. Indications for surgery in acute mastoiditis and their complications in children. Int J Pediatr Otorhinolaryngol. 2006;70:1175–82. doi:10.1016/j.ijporl.2005.12.002.
4. Migirov L, Kronenberg J. Mastoidectomy for acute otomastoiditis: our experience. Ear Nose Throat J. 2005;84:219–22.
5. Zavras P, Potamianos S, Psarommati MZ, Psarommatis I, et al. Acute mastoiditis in infants aged six months or younger. J Laryngol Otol. 2020;134:721–6. doi:10.1017/S0022215120001693.
6. Coticchia J, Shah P, Sachdeva L, Kwong K, et al. Frequency of otitis media based on otoendoscopic evaluation in preterm infants. Otolaryngol Head Neck Surg. 2014;151:692–9. doi:10.1177/0194599814544887.
7. Lim R, Zulkifli S, Hailani I, Hashim ND. Managing a complicated acute otomastoiditis at day four of life. Cureus. 2021;13:e12905. doi:10.7759/cureus.12905.
8. Sousa Menezes A, Ribeiro D, Pereira S, Ramires A, Dias L. Acute mastoiditis in a newborn with 11 days of life: case report. Int J Pediatr Otorhinolaryngol. 2020;130:109787. doi:10.1016/j.ijporl.2019.109787.
9. Kaufmann MR, Shetty K, Camilon PR, Shetty A, et al. Management of acute complicated mastoiditis: a systematic review and meta-analysis. Pediatr Infect Dis J. 2022;41:297–301. doi:10.1097/INF.0000000000003452.
10. Heywood EG, Stubington T, Chandarana K, Bowerman K, et al. Complications of acute mastoiditis in a paediatric population at a UK tertiary centre: a retrospective review. Clin Otolaryngol. 2024;49:264–9. doi:10.1111/coa.14128.