Objective: To report a case of bilateral nasal vestibular stenosis from nasal CPAP/cannula use in a neonate.

Study Design: Case report and review of literature.

Methods: A detailed clinical history, CT imaging, intraoperative and post-operative photographs is presented and the current literature is reviewed.

Results: A female, born at 29 weeks, with history of 10 days of nasal CPAP and 37 days of nasal cannula use was transferred to the NICU from an outside hospital for otolaryngologic evaluation of respiratory distress. Immediately after birth, nasal catheters were passed without difficulty through both nasal passages. At nearly 7 weeks of age, nasal CPAP revealed bilateral near complete vestibular stenosis right at the tip where the nasal CPAP/cannula was positioned. CT scan of the facial bones demonstrated an anterior soft tissue band which, although both nasal airways were normal. Nasal repair was successfully performed endoscopically with lysis, application of mitomycin c, and nasal stenting with endotracheal tubes.

Conclusions: Bilateral vestibular stenosis can be a complication of nasal CPAP/cannula use, which may lead to chronic obstructive breathing. Such complication among neonates is not well documented in the literature to date, and it is likely underdiagnosed. Further studies are needed to elucidate incidence of acquired vestibular stenosis from nasal CPAP/cannula.

INTRODUCTION

Alternative methods of oxygen supplementation are used frequently in the neonatal intensive care unit (NICU) to avoid long-term endotracheal intubation which can result in acquired subglottic stenosis. Nasal continuous positive airway pressure (CPAP) provides an effective alternative and is used routinely at many pediatric institutions. Nasal CPAP provides a system of less resistance to oxygen delivery, allowing better tolerance and palatability. There are, however, anecdotal reports in the literature indicating that nasal CPAP support may also cause significant nasal complications in an obligate nasal breathing population. Loftus and colleagues described eight patients with nasal deformities attributed to nasal CPAP use, including but not limited to, nasal vestibular stenosis.

Iatrogenic nasal vestibular stenosis results from disruption of the nasal vestibule lining with resultant proliferation of granulation and fibrous tissue. In addition to occurring in association with nasal CPAP use, it has been described as a result of previous nasal surgical procedures, nasotracheal intubation, nasal packing, excessive cauterization for epistaxis, and birth trauma. Congenital cases of nasal pyriform aperture stenosis, a different embryologic entity, has been described; however, nasal vestibular stenosis is an acquired process.

Nasal CPAP is gaining popularity as a preferred means of ventilatory support in the NICU, and potential complications of this are starting to be seen more frequently. Smith and colleagues reported a case of a 6-week-old neonate with bilateral nasal nasal stenosis following respiratory assistance in the form of nasal CPAP catheters for 3 weeks, ultimately requiring endoscopic stenting, bilateral stenting, and repeated dilations. Similarly, Smith and colleagues describe two cases of vestibular stenosis following the use of nasal CPAP. One case described was in a 4-month-old ex-26 week premature infant who was found to have bilateral nasal vestibular stenosis obstructing 80% of the nasal airway and causing significant cosmetic deformity. They reported another case of bilateral vestibular stenosis causing 95% of nasal airway obstruction with significant cosmetic deformity as well. Both required surgical correction due to pre-term labor. Apgar scores were 9 at both 1 and 5 minutes. The mother was given adequate doses of steroids prior to delivery. After birth, nasal CPAP was placed and nasal catheters were passed through both nares without difficulty. No intubation was required. Nasal CPAP was removed after 10 days and placed in an oxygen tent prior to nasal cannula. The neonate was on nasal cannula for a total of 37 days prior to transfer to Columbus Children’s Hospital for evaluation of respiratory distress with feeding and failure to thrive.

Upon arrival at nearly 7 weeks of age, otolaryngologic consultation was obtained. On physical examination, the neonate was in no acute distress and was tolerating nasal CPAP without difficulty. Nasal CPAP was continued and nasal cannulas were placed through both nares without difficulty. No intubation was required. Nasal CPAP was removed after 10 days and placed in an oxygen tent prior to nasal cannula. The neonate was on nasal cannula for a total of 37 days prior to transfer to Columbus Children’s Hospital for evaluation of respiratory distress with feeding and failure to thrive.

Only a few cases of nasal vestibular stenosis from neonatal CPAP administration have been reported to date. We present a case of bilateral, nearly complete vestibular stenosis which resulted after only 10 days of nasal CPAP and 37 days of nasal cannula use. Our patient was successfully surgically repaired by endoscopic lysis, application of mitomycin c, and nasal stenting. As endoscopic evaluation of the nose is not a standard practice in the NICU setting, it is likely that this complication is underdiagnosed. This may have long-term implications for future sinonasal problems. Further studies are needed to determine the exact incidence.

REFERENCES