Case Report

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Patent urachus with methicillin-resistant coagulase negative staphylococcal sepsis in a 23 days old neonate

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ABSTRACT

A remnant of the umbilical arteries, urachus, is a transverse structure lying between the peritoneum and the fascia transversalis. Urachus results from the involution of the embryonic duct and the ventral cloaca. The Urachus drains the bladder of the fetus by running within the umbilical cord. Usually, during embryonic development, the urachal tract obliterates. Failure of complete obliteration of the urachus, which is reported to be present in approximately 30% of adults, can lead to several abnormalities of the urachus. Common abnormalities of the urachus include - urachal cyst, diverticulum, umbilical sepsis, or patent urachus. This is a case report of a 23 days old female neonate who presented to us with complaints of fever for 11 days and umbilical discharge for 4 days. Clinical, microbiological, and radiological examinations revealed patent urachus with Methicillin-resistant coagulase-negative staphylococcal (MR-CoNS) umbilical sepsis. It is a rare condition that requires management with higher antibiotics based on culture and sensitivity tests.

Keywords: Patent urachus, Umbilical sepsis, MR-CoNS

INTRODUCTION

An embryological remnant of the allantois, urachus, is a transverse structure lying between the peritoneum and the fascia transversalis. As the urinary bladder descends towards the pelvis, it stretches the urachus, causing the obliteration of the lumen.¹ This obliteration takes place with the increasing gestational age. However, partial or complete failure of the obliteration of the lumen of urachus is not uncommon. Failure of complete obliteration of the urachus, which is reported to be present in approximately 30% of adults, can lead to several abnormalities of the urachus. Urachal anomalies are commonly present as pain over the abdomen or sepsis in the umbilical region. There are four types of congenital urachal remnant anomalies.² They are: patent urachus: a communication between the bladder and umbilicus through a urachus that has not involuted, urachal cyst: a fluid-filled dilatation of the mid urachus, umbilical-urachal sinus: blind focal dilatation of the umbilical end of the urachus and vesicourachal diverticulum: blind focal dilatation of the bladder end of the urachus.

CASE REPORT

A 23-day old female neonate, delivered at full term on 26th March 2020 with a birth weight of 2.8 kg, presented to us with complaints of fever for 11 days and umbilical discharge for 4 days. The patient was receiving outpatient department (OPD) based medications for fever from a private hospital and later on developed redness around the umbilicus for 4 days before presentation.

Clinical findings

On clinical examination, a 2×2 cm² size swelling was present around the umbilicus along with redness around the umbilicus and low-grade fever. There was a yellowish color discharge from the umbilicus. The baby had no blackening around the umbilicus and there were no other symptoms present.

Diagnostic focus and assessment

Blood routine investigations of the patient revealed leukocytosis. A culture and sensitivity test was performed with umbilical pus swab as the specimen, and the pathogen isolated was *Methicillin-resistant coagulase-negative staphylococci* (MR-CoNS). Further, drug susceptibility test for MR-CoNS revealed susceptibility to vancomycin and linezolid, and resistance to gentamycin, cefoxitin, amoxicillin + clavulanic acid, co-trimoxazole, clindamycin, and erythromycin.

Ultrasonography revealed approximately 1.1×1 cm² ill-defined hypoechoic collection noted in the skin and the subcutaneous plane of the umbilical region along with patent urachus with a tract extending from the umbilicus up to the dome of the urinary bladder.

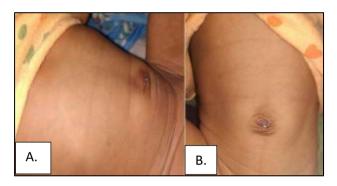


Figure 1 (A, B): The umbilicus of the neonate after treatment with higher antibiotics. No redness or swelling around the umbilicus is present.

Therapeutic assessment

Conservative management of the patient was undertaken by intravenous administration of higher antibiotics like piptaz (piperacillin and tazobactam) for 7 days, followed by vancomycin for 14 days. Repeat ultrasonography (USG) following the treatment showed the disappearance of the collection in the umbilical region compared to the previous scan. Post-treatment clinical examination revealed a clear umbilicus with no discharge and the redness around the umbilicus had subsided (Figure 1).

DISCUSSION

Patent Urachus presenting with the MR-CoNS umbilical sepsis is a rare condition. The prevalence of urachal anomalies among newborns is 1:5000 live births.³ Patent urachus can lead to infection of the umbilicus, also known as omphalitis. Most common pathogens causing umbilical cord sepsis include *Staphylococcus aureus*, *Streptococcus pyogenes*, and gram-negative bacteria such as *Escherichia coli*, *Klebsiella pneumoniae*, and *Proteus mirabilis*.⁴ In

developing countries, the incidence of omphalitis in neonates delivered at hospitals can approach 8%, and if born at home, the incidence can be as high as 22%.5 Urachal anomalies are of crucial importance since it can be easily missed. Urachal anomalies are rarely observed clinically and only eight of 40,000 cases being admitted to a surgical department.6 Since urachus is located in a clinically silent area, in the space of Retzius, possible symptoms and clinical signs of inflammation in most cases, are nonspecific or delayed, or even absent. Typical clinical manifestations of patent urachal pathologies are umbilical discharge, abdominal pain and tenderness, erythema, or a mass within the umbilicus. The differential diagnosis should include, mainly acute appendicitis, cystitis, inflammatory bowel disease, strangulated umbilical hernia, hematoma, pelvic or intra- abdominal abscess, and Meckel's diverticulum.7 For clinical diagnosis, USG, contrast enhanced computed tomography (CT) abdomen or sometimes sinogram can be used. Additional studies, including voiding cystourethrogram or cystoscopy, play very little roles in an otherwise asymptomatic patient. One of the common complications of patent urachus in the intensive care units remains umbilical sepsis.

Recent trends have shown an increase in coagulase-negative staphylococci. MR-CoNS is commonly a nosocomial pathogen, mainly prevalent in the neonatal intensive care units.8 Staphylococcal sepsis is particularly common in neonates because of high susceptibility to infection and a weaker immune system. However, MR-CoNS develops usually in the intensive care settings and hence, it is difficult to treat. Conservative management usually involves higher antibiotics administered intravenously.

In this particular case of 23 days old neonate presented to us umbilical discharge and delayed umbilical healing. Investigations revealed that the patient had a patent urachus and developed umbilical sepsis with MR-CoNS. The pediatric surgeon recommended treating the patient conservatively. Hence after drug resistance and susceptibility testing, treatment with intravenous higher antibiotics was initiated. After aggressive treatment for 14 days, the umbilical sepsis subsided and healing took place along with the obliteration of the fistulous tract. Since an association of patent urachus with MR-CoNS umbilical sepsis is rare, it is also difficult to diagnose. A culture and sensitivity test are recommended for the cases of umbilical sepsis and judicious use of higher antibiotics is recommended.

CONCLUSION

In conclusion, our case report highlights the importance of early evaluation in the case of umbilical sepsis with drug resistance when conventional pharmacotherapies fail. Since MR-CoNS sepsis is particularly observed in the neonatal intensive care units, it is highly recommended to perform drug culture and sensitivity test before

administering antibiotics to neonates. An ultrasound examination along with culture and sensitivity test is highly valuable as the first approach in case of patent urachus presenting along with umbilical sepsis and treatment with susceptible antibiotics should be given as a part of the conservative management.

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