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Rusty pipe syndrome: a case report

Rusty pipe syndrome is a rare but benign self-limiting condition characterised by spontaneous, painless, bilateral bloody nipple discharge in lactating mothers. This can cause significant anxiety for mothers and caregivers. We report on the case of a term newborn who was admitted to the neonatal unit because of respiratory distress. Expressed breast milk from the mother on day 1 was brownish blood stained. The bloody discolouration of the milk improved from the second day and cleared by day 4.

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Keywords

infant nutrition; breastfeeding; neonatal health; paediatrics; rusty pipe syndrome

Key points

Mathews A.Z., Ibhanesebhor S., Khalil M., Manjunatha C. Rusty pipe syndrome: a case report. *Infant* 2023; 19(1): 15-17.

1. Rusty pipe syndrome is an uncommon and benign self-limiting condition.
2. Blood-stained breast milk can be alarming for lactating women and caregivers.
3. Awareness of this condition as benign among healthcare professionals will ensure appropriate support is provided, eg lactation counselling to relieve anxiety, reduce unnecessary investigations and avoid the inappropriate introduction of formula feeds.

The case

A term male baby (37 weeks' gestation, weight 2.75kg) was born to a gravida 4, para 2 mother by elective caesarean section due to two previous caesarean sections. The Apgar scores were 8 and 9 at one and five minutes, respectively. The baby's post-birth transition was unremarkable, and the baby was transferred to the postnatal ward.

At about 2 hours of age, the baby was admitted to the neonatal unit because of respiratory distress and required supplemental oxygen and intravenous (IV) fluids for 24 hours. Systemic examination was within normal limits. The blood culture was negative after 48 hours of incubation and antibiotics were discontinued. The baby's chest X-ray was normal.

The mother's blood group was O positive and the baby was A positive with a positive direct antiglobulin test and a high level of umbilical cord bilirubin. The baby received phototherapy on day 1, with normal subsequent bilirubin levels. The full blood count and reticulocyte count were normal.

On day 1, while expressing milk with a breast pump, the mother noticed brownish, blood-coloured milk coming from both breasts (**FIGURE 1A**).

Examination of the breasts revealed no fissures or cracks in the nipples or signs of mastitis, and there was no history of trauma or painful discharge from either breast. Moreover, no natal teeth were detected on examination of the mouth of the baby. The mother was in good health with no fever or bleeding from any other sites. There was no past history of blood-stained milk while breastfeeding her previous infants.

From the history and clinical examination, we made a provisional diagnosis of rusty pipe syndrome; the mother was supported to continue breastfeeding and advised to undergo ultrasound examination of the breasts to complete the investigation.

On day 1, the baby was started on suck feeds with expressed breast milk through the bottle and the mother was encouraged to breastfeed directly. IV fluid was discontinued after 24 hours.

On day 3 of life, the baby had 8.7% weight loss and a serum sodium of 147mmol/L, which improved to 143mmol/L with continued direct breastfeeding. The brownish discolouration of the milk improved from the second day onward and had almost completely cleared by day 4 (**FIGURE 1B** and **1C**) when the baby was discharged home.

At the outpatient clinic review on day 10, the baby was breastfeeding on demand with satisfactory weight gain and normal findings on systemic examination. The breast milk was completely clear of the previous discolouration.

Discussion

Rusty pipe syndrome is a rare, benign but transient condition that involves spontaneous and painless bloody nipple discharge during gestation and lactation.[1,2] The bloody discharge is usually bilateral but may be unilateral to begin with and, in most cases, starts at birth or early in lactation, although it may start in pregnancy.[1,3] Rusty pipe syndrome is thought to be due to increased stromal vascularisation that is associated with rapid alveolar and mammary duct growth; moreover, the delicate capillary network

can break easily, resulting in bloody nipple discharge.[1-3] It is a self-limiting condition that usually resolves within seven days of the onset of lactation.

The exact incidence is not known as this condition is missed in many mothers and is primarily diagnosed in those mothers who provide expressed breast milk to feed their baby, or in those who notice when their baby vomits blood, giving a negative Apt test result for fetal haemoglobin.[4,5] Rusty pipe syndrome is more common in primigravida women and is associated with nipple stretching exercises such as Hoffman's procedures, which are recommended for flat or inverted nipples.[1]

Investigations

There are no specific investigations required in cases of rusty pipe syndrome with the typical presentation. The course of the disease – onset early in lactation, painless discharge, resolution within a few days and a normal clinical examination – is helpful in ruling out non-benign conditions that cause a blood-stained discharge of breast milk.

The diagnosis of rusty pipe syndrome is commonly based on medical history and routine physical examination. Ultrasound examination of the breasts may be considered as a preliminary investigation. Specialised investigations such as cytological analysis of the bloody discharge and breast imaging may be required to rule out other pathological conditions, especially if the symptoms persist.[6,7]

Differential diagnoses

Other conditions causing blood-stained breast milk include:

- cracked nipples
- mastitis
- trauma
- vascular engorgement
- duct papilloma
- fibrocystic disease
- breast carcinoma.

Most cases of blood staining in breast milk are due to benign conditions. One of the most common causes of blood staining or pink streaks in breast milk is cracked nipples, which may be due to a poor breastfeeding technique. Mastitis, trauma or vascular engorgement can also cause bleeding; however, these conditions are painful and diagnosed upon clinical examination. Additionally duct papilloma usually causes spontaneous, painless, unilateral bloody discharge from a single duct.[6,7] Fibrocystic disease shows areas of lumpiness and associated mastalgia.[4]

Colonisation of the expressed breast milk by the bacillus, *Serratia marcescens*, can later cause a pinkish colour change of the milk, but in rusty pipe syndrome there is discharge of blood-stained milk directly from the milk ducts.[8]

In our index case, painless, brownish bloody discharge occurred from both breasts from day 1. No local cause was found and the breast milk cleared spontaneously by the fourth day of lactation. This continued to be normal at the outpatient follow-up, supporting the probable diagnosis of rusty pipe syndrome. The mother did not undergo ultrasound imaging of the breasts as advised because the symptoms resolved. In rusty pipe syndrome, blood contents may cause gastrointestinal irritation symptoms, such as vomiting or regurgitation.[9] In our case, the baby tolerated the breast milk with no gastrointestinal symptoms.

Treatment

No treatment is necessary for rusty pipe syndrome; the condition is benign and self-limiting.

Conclusion

In summary, rusty pipe syndrome is a rare, benign, self-limiting condition that can cause significant anxiety in mothers, caregivers and healthcare professionals.

The aim of this case report is to raise awareness of this benign condition to enable healthcare staff to give appropriate lactation counselling to help relieve undue anxiety among lactating mothers, prevent interruption of breastfeeding, reduce unnecessary investigations and avoid inappropriate introduction of formula feeds.[5,10,11]

Parental consent

The authors obtained written consent from the child's parents for publication of the case history and images.

Author contributions

AM: Treated the patient, idea for the article, consent from the parents, wrote up the article, performed the literature review. SI: Treated the patient and follow-up, consent from the parents, wrote up the article, performed the literature review. MK: Involved in treating the patient, getting consent and the literature review. CM: Wrote up the article, performed the literature review.

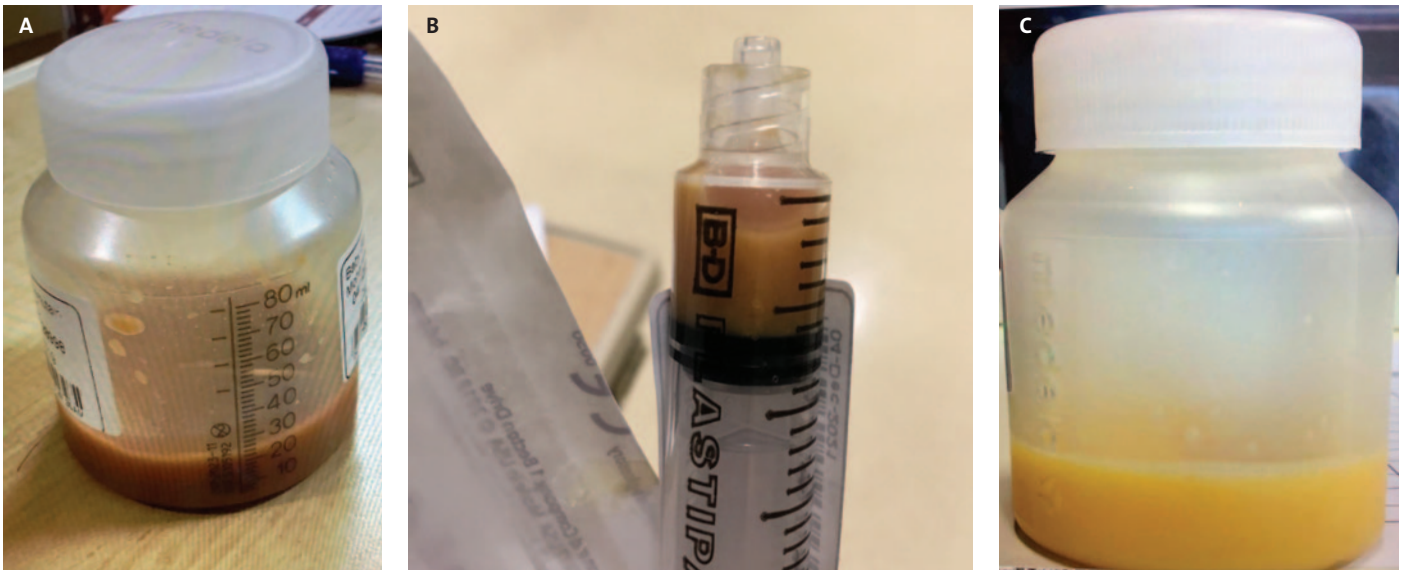

FIGURE 1 Breast milk on (A) day 1, (B) day 2, (C) day 4.

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