Journal of Neonatal Nursing 30 (2024) 20–23

Contents lists available at ScienceDirect

Journal of Neonatal Nursing

journal homepage: www.elsevier.com/locate/jnn

Management of peristomal complications in neonates: 3 case reports

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ARTICLE INFO

Handling Editor: Ms L Altimier

Keywords:
Neonatal ostomy
Nursing care
Ostomy care

ABSTRACT

Background: Temporary and permanent ostomies are created in neonates during the surgical treatment of various diseases. Such patients are physiologically and structurally immature, and their special needs can pose a challenge to treatment and care.
Cases: This study describes the stoma care of 3 neonates who developed peristomal complications.
Conclusion: The development of an appropriate stoma management plan that responds to the specific care needs of the neonate will facilitate the improvement of care quality in such cases.

1. Introduction

There is a wide range of conditions that may require an ostomy for the management of a variety of anatomical and functional problems in neonates, such as necrotizing enterocolitis (NEC), Hirschsprung's disease, high imperforate anus, meconium ileus, intestinal atresia, and volvulus (Lockhat et al., 2016; Kargl et al., 2017). The main purpose of creating intestinal ostomies in neonates is to provide decompression by opening the obstructed intestine, to protect an anastomosis, and to prevent mortality and morbidities (Lee et al., 2014). The main goals of post-operative care in such cases are to monitor the functioning of the ostomy, to maintain the fluid-electrolyte balance, to provide nutrition, to ensure appropriate ostomy skin care, to involve the family in care, and to prevent complications (Chandler, 2014). It may take time for families to accept that their child has an ostomy and to develop the necessary self-confidence for the management of care. Nursing care is important in ostomy care for the prevention of complications and for supporting families in their adaptation to life with a baby with an ostomy (Li et al., 2019).

Emergency abdominal surgery for the creation of an intestinal ostomy is important for survival in neonates but comes with potential complications associated with such factors as the diagnosis leading to surgery, the time of birth, the newborn's weight, the incision site and the type of stoma created (Lockhat et al., 2016). Rates of ostomy complications such as retractions, necrosis, stenosis, wound infections, peritonitis, skin problems, stenosis, and prolapse after the creation of an enterostomy vary between 41% and 64% (Aguayo et al., 2009; Lee et al., 2014; Bethell et al., 2017). The risks are increased by developmental differences in the physiology of the newborn's fragile skin, such as in the immature epidermal barrier function, especially when complications develop in the peristomal area. The neonate's small body size, the formation of more than one stoma, the presence of peristomal tubes and the surgical incisions may complicate ostomy care. Premature or low birth-weight infants are at risk of transepidermal water loss, chemical damage due to topical agents applied to the skin, and friction and stripping injuries occurring during the removal of adhesives from the skin (WOCN POC, 2016). Appropriate ostomy care should consider the principles of pediatric ostomy care for the prevention of complications, and ensuring the comfort of the baby in its life with an ostomy. It has been reported that the application of these principles by enterostomy-trained nurses to the care of neonates supports a decrease in ostomy complications (Li et al., 2019).

Wound ostomy incontinence care nurses are specialists who are trained in the management of ostomies in different age groups and with different disease diagnoses. In addition to being familiar with the use of ostomy products, they also have knowledge of skin and wound care. The inclusion of wound ostomy incontinence care nurses on the teams providing care to such neonates will enhance the level of care provided to both neonates with ostomies and their parents. The case studies presented here detail the successful management of neonates with peristomal complications.

2. Case 1

A 30-week-gestation male neonate born with a birth weight of 1810 g underwent surgery by a pediatric surgeon on the 8th postnatal day for a

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https://doi.org/10.1016/j.jnn.2023.07.019
Received 2 June 2023; Received in revised form 25 July 2023; Accepted 25 July 2023
Available online 30 July 2023
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perforated NEC. A diversion ileostomy and a mucus fistula were created after a partial small bowel resection, and the patient was followed up after a mucocutaneous separation occurred between stomas while the patient was being observed in the neonatal intensive care unit (NICU). In the immediate post-surgery period, more than one ostomy bag change was required per day due to leakage. The goals of ostomy care were to provide an environment supportive of wound healing and to reduce skin trauma by keeping the ostomy bag on the neonate's body for longer periods. After the wound bed was irrigated with a saline solution and the suture materials were removed, an alginate dressing was applied to prevent the contact of feces with the wound bed. To ensure the adherence of the adapter to the skin and to prevent leakage, the alginate cover and the spaces around the stoma were covered with minimal ostomy paste, after which, a one-piece flat flexible pediatric drainable pouch without a tape border was applied after an opening was cut for each stoma. The pouch was applied to the body sideways to facilitate emptying with a plan to change the ostomy bag every 48 hours. Throughout this process, enteral nutrition was provided to support wound healing and the sustainability of the metabolism. The wound between the stoma was epithelialized on the 17th postoperative day (Fig. 1).

After the neonate was medically discharged from the NICU, the parents stayed with their baby in the NICU observation room for three days. After receiving ostomy care training, the mother took over the care of the baby's ostomy. The neonate and his parents were discharged from the observation unit after the peristomal complication had been resolved, and the parents received all necessary education for the continuation of ostomy care. Further follow-ups were continued on an outpatient basis.

3. Case 2

A 69-day-old term baby girl who was operated on with a diagnosis of NEC, and was discharged with an end ileostomy was evaluated in the outpatient clinic. The mother reported persistent leakage from the pouch bag, pain and wound formation for a period, and requested further pouching recommendations. After the pouching system was removed from the baby's skin, irritant dermatitis was observed in all peristomal quadrants with the resulting skin loss in subcutaneous tissue (Fig. 2). The family's approach to ostomy care was evaluated, and it was determined that the parents were cutting the pouch wafer wider than the diameter of the stoma. After all materials and feces were removed, the peristomal area was cleaned with a normal saline solution and dried with gauze, and a thin alcohol-free paste was applied around the stoma after dusting the areas in contact with the skin with stoma powder, after which an alcohol-free liquid barrier was sprayed on the areas with skin integrity. Pouching involved the application of a two-piece flat pouching system with an ostomy bag adapter wafer cut to the appropriate size for the diameter of the stoma, with the aim being to provide three to four days of wear for the pouching system, after which a follow-up



Fig. 2. Peristomal skin breakdown, irritant contact dermatitis in case 2.

examination was planned. The planned ostomy care was communicated to the family, after which the wound ostomy and incontinence nurse attended to the baby's stoma observed by the mother, and a repeat demonstration was made. On the 8th day of patient follow-up, the leakage problem had been resolved and the wounds to the skin around the stoma had healed.

4. Case 3

On the 32nd day of life, a 26-week-gestation female neonate with a birth weight of 780g was admitted to the NICU after surgery for a perforated NEC that resulted in a double-barrel ileostomy in the right lower quadrant of the abdomen. The surgery resulted in two parallel incision lines: one on the midline of the abdomen, and the other near the stoma on the right lower quadrant of the abdomen. The initial physical examination revealed the healing of the incision lines to be incomplete, there were many suture materials, and the development of irritation in the peristomal area. A thin layer of ointment containing polyethylene glycol was applied to the incision line and covered with an alginate dressing, and a transparent drape was applied over the alginate cover to create a flat surface for the application of the pouch adapter. A peristomal irritation in the left upper quadrant of the stoma was treated with stoma powder, and care was provided with a single flexible pediatric ostomy bag. To adapt to the small size of the infant and to prevent leakage resulting from leg movements, some of the adapter material was cut from the outer lower end. The mouth of the pouch was positioned towards the side of the neonate's body, and a 48-h change period was planned for pouching renewal. The sutures to the incision line were removed on the 18th postoperative day and care continued for several days involving the application of a colloid dressing to protect the epithelialization on the incision line. The peristomal complication had completely disappeared by postop day 21 (Fig. 3), after which ostomy care continued with ostomy paste and a one-piece pediatric ostomy bag, to be replaced every 72 hours.

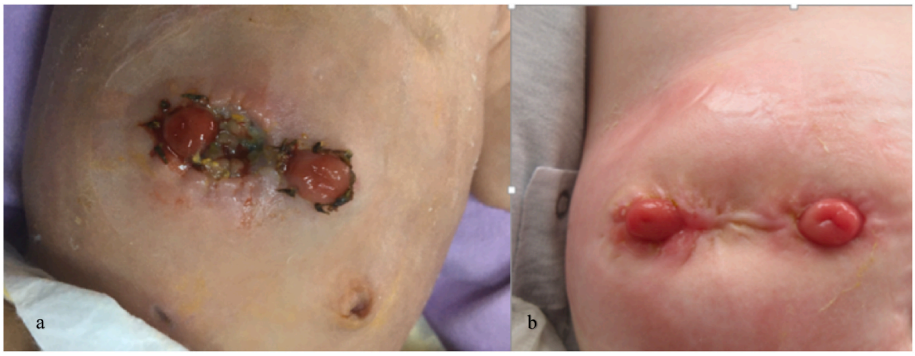


Fig. 1. Mucocutaneous separation in case 1. (a) peristomal complication before ostomy care, (b) 17 days after first stoma care.

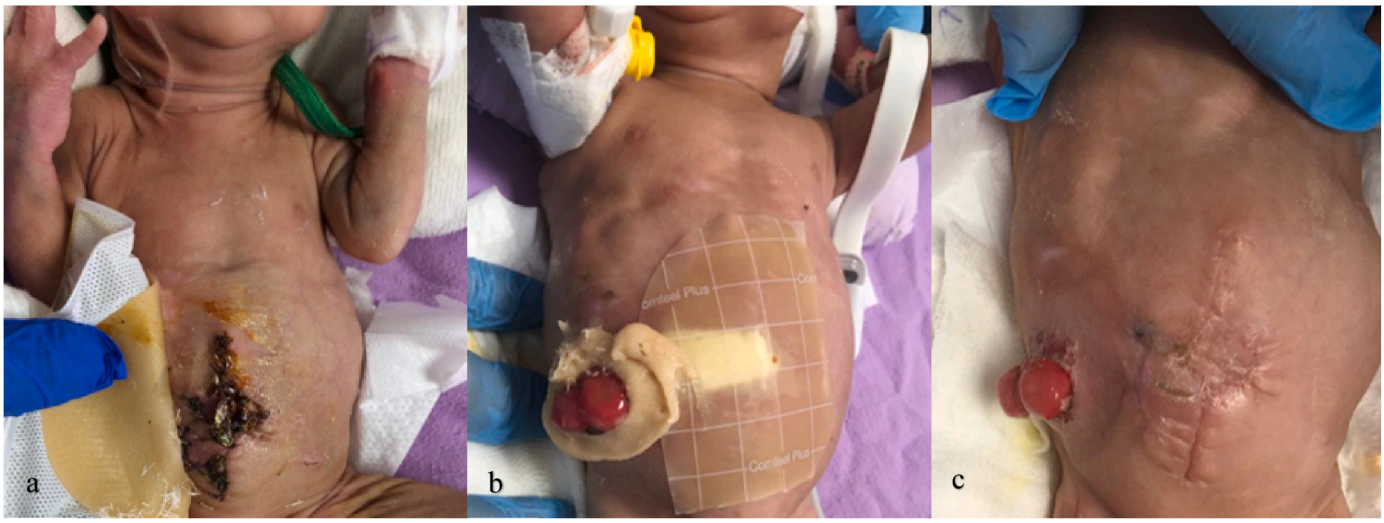


Fig. 3. (a) Skin and peristomal complication in case 3, (b) Ostomy management with alginate dress, stoma paste, hydrocolloid dress and pediatric pouches (c) Three weeks after first ostomy and wound care.

5. Discussion

Enterostomies are surgical interventions that are applied to save the life of neonates, to eliminate the existing pathology and to increase quality of life. As with many surgical interventions, complications developing after surgical procedures can result in the need for a stoma in newborns (Lockhat et al., 2016; Kargl et al., 2017; Beger et al., 2018). Ostomy complications in neonates include peristomal skin problems, bleeding, ischemia, necrosis, bowel prolapse, stenosis, retraction and parastomal hernia (Aguayo et al., 2009; Beger et al., 2018). Among the reasons for the development of such complications, it is seen that many factors such as the surgical technique applied for the operation, the particular diagnosis that caused the need for a stoma, the length of stay, the location and type of stoma, the presence of comorbid diseases and wrongly used or selected pouching system. (Aguayo et al., 2009; Kargl et al., 2017). Other factors leading to complications in neonates are the selection of inappropriate ostomy equipment and a lack of planning for individualized care (İlhan and Toruner, 2015). Inconsistencies in ostomy care between caregivers on different shifts are another potential factor in the development of peristomal complications (Brunette, 2017). While there have been many studies discussing the conditions that require an enterostomy and the incidence of complications in neonates, few to date have focused specifically on ostomy management.

Neonates, especially those born prematurely, differ considerably from larger newborns, children, and adult patients (Li et al., 2019). As premature infants have an immature epidermal barrier, the weak bond between the epidermis and dermis poses a risk to skin integrity when removing the adhesive covers used in ostomy care, which can lead to friction injuries or stripping of the skin (WOCN POC, 2014).

Adhesive removal products made for adults should not be used for the removal of the pouch wafer from the skin in neonates (WOCN POC, 2016). Additionally, topical agents can disrupt the acid mantle of the skin (slightly acidic pH) that acts as a barrier against microorganisms. The immature skin structure of neonates is very thin and is more sensitive to chemicals than adult skin, therefore, ostomy care in neonates requires the use of reliable products that are approved for use with children and neonates.

Stoma powders, zinc-containing barrier creams and silicone-based barrier products can be used for the treatment of skin problems in the peristomal area (WOCN POC, 2016), among which, silicone-based products are the most reliable, being inert, leaving no residue, providing an effective barrier for longer periods and having a lower allergy potential (Swift et al., 2020). Non-alcoholic paste rings or strips are preferred over alcohol-based stoma pastes due to the absorption of alcohol through the neonate's thin skin (Brunette, 2017). There are a variety of brand options for pediatric enterostomy bags, and it is generally reported that a 24-h usage time is ideal for pediatric ostomy bags, with 12–48 hours recommended as an acceptable usage time (WOCN POC, 2014). These time periods may vary in the presence of complications arise.

The peristomal complications in the cases presented here were related to mucocutaneous separation and irritant dermatitis. Regarding the causes, in the first case, the mucocutaneous separation that occurred post-surgery was not managed as the planned ostomy care included inappropriate materials. In the second case, the information provided to the parents on the application of the pouch adapter was lacking, and led to the development of irritant dermatitis. In the final case, the pediatric healthcare team lacked knowledge of the incision area and ostomy care, and referred the patient for care planning. In all three cases, appropriate ostomy care products were identified, applied and renewed at the appropriate intervals. To ensure the maintenance of proper ostomy care, the neonatal intensive care unit nurses were provided training in ostomy care, and patient exams were scheduled at least twice a week. Finally, the infants' families were also educated in ostomy care to support the prevention of the re-occurrence of peristomal complications.

Moistened gauzes with warm water were utilized rather than the adhesive removers used for adults to prevent skin irritation or epidermal stripping when removing the pouch wafer during care. A saline solution applied with gauze was used to clean the peristomal area and the wound bed, and the surrounding skin was dried thoroughly before applying the pouch wafer to ensure optimum adhesion. All products intended for use on the neonate were selected after evaluating the possible risks, and care was taken to use an alcohol-free ostomy paste. In the cases discussed here, the intended wear time period for the pouch was 48 hours, in an attempt to prevent the skin trauma associated with short-term pouch changes and to allow the evaluation of the healing of skin complications. The targeted 48–72 hour wear period was achieved in all cases, and no skin trauma developed.

Comprehensive ostomy care, which for neonates begins in the hospital, must be continued to prevent complications after discharge. It is, therefore, very important to involve parents in the ostomy care of their child while in the hospital and to make them feel a part of the process. Parents must be educated in all aspects of ostomy care if they are to understand and meet the needs of their child in regards to the stoma. For parents who have already been through prior stressful diagnoses, treatments, and surgical procedures with their child, the process of

ostomy care brings added anxiety, and parents who are afraid of causing harm may be reluctant to carry out such essential tasks as renewing and emptying their child's ostomy bag.

When educating parents about ostomy care, they should first observe the process before carrying out ostomy care under the supervision of the wound ostomy and incontinence nurse (Chandler, 2014). In addition to this training, nurses should provide parents with emotional and psychological support. Studies of ostomy care, as well as pediatric ostomy care guidelines, emphasize the need to plan and implement individualized neonatal care while educating and integrating the family into the care of their baby (Brunette 2017; WOCN POC, 2016; Argo, 2014). In the presented cases, the mothers were provided ostomy care training before the baby was discharged from the NICU. During these training sessions, under the supervision of the wound ostomy and incontinence nurse, the parents practiced providing ostomy care to their babies, and after discharge, the neonates underwent further examinations in the wound and stoma therapy unit.

6. Conclusions

The primary purpose of neonatal and preterm infant ostomy care is to prevent ostomy complications through the provision of interprofessional collaboration and evidence-based nursing. Whenever possible, wound ostomy and incontinence nurses should be involved in the care of ostomies to ensure optimal comfort for the neonate, and the involvement of wound ostomy and incontinence nurses will also provide the healthcare team and families with the necessary guidance on the safe use of neonatal ostomy care products. Parents should be considered part of the team. Products devised specifically for neonatal ostomy care have recently been developed, although caution is still needed when using these products, which involves problem-solving and innovative thinking. Pediatric nurses and physicians with expertise in pediatric care must collaborate with ostomy care nurses as part of a multidisciplinary approach, and a collaborative and holistic care approach can provide optimal quality care to both the neonate with an ostomy and his/her family.

Ethics approval

This study was approved by the XYZ Scientific Research Ethics Committee (Numbered, 2020-396, dated 2020). In addition, the parents of the neonates were informed about the use of the photographs, and verbal consent was obtained.

Acknowledgments

We would like to express our sincere thanks to the parents of all the neonates for giving us consent.

Abbreviations

NEC	Necrotizing enterocolitis
WOCN	Wound, Ostomy and Continence Nurses Society
NICU	Neonatal Intensive Care Unit

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