A novel approach to the management of exomphalos in the neonate

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Introduction

Exomphalos describes a herniation of the intra- abdominal viscera through an open umbilicus ring at the base of the umbilical cord. The hernia is covered by a clear, three-layered membrane of peritoneum, wharton's jelly and amnion.

Exomphalos is among the most common surgical malformations diagnosed during the antenatal period and is thought to occur because of incomplete foetal growth and the fusion of the cephalic, lateral, and caudal tissue folds. Usually neonates diagnosed with an exomphalos are delivered via a planned lower section caesarean-section.

These are typically divided into major or minor exomphalos depending on the abdominal wall defect, i.e. >5cm or <5cm in diameter or based on the organs involved (Kilby et al, 1998). With minor exomphalos there is little controversy regarding the ideal treatment: primary surgical closure with fascial apposition. Major exomphalos are more difficult to manage in the neonate population and can involve a surgical intervention to replace the abdominal contents back into the abdominal cavity or a conservative approach whereby the sac is allowed to desiccate, contract and epithelialize creating a ventral hernia (Rijhwani et el, 2005). This approach may require prolonged hospitalization until epithelialisation is achieved and before the hernia can be closed.

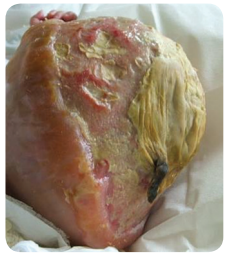
Aim

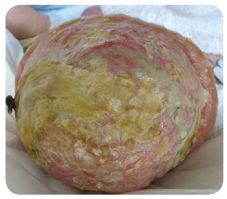
The aim of this case study is to discuss the complex wound care needs and management of a major exomphalos involving the liver, bowels and stomach.

Case study

The diagnosis of the exomphalos on Baby Blue was made at a routine 12-week gestational ultrasound scan. The clinical decision at the time was to deliver the baby though a LSCS at a specialist maternity unit for high risk pregnancies. Unfortunately this management plan was not successful. At 30 weeks gestation spontaneous vaginal delivery occurred at a local general hospital without the specialist facilities.

At birth the exomphalos ruptured with the liver, bowels and stomach exposed. The baby was then transferred to a neonatal intensive care unit (NICU) for medical and surgical management. The exomphalos was being managed for 3 months locally on the NICU, until the Tissue Viability Team became involved in the management of the wound. The preceding wound management for this included various ad-hoc treatments options that varied from sugar paste to intrasite gel.





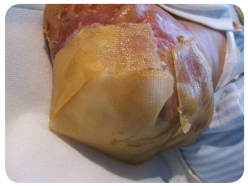
It was likely that the surgical team decided to allow the wound to close through a mixture of partial surgical closure and conservative management.

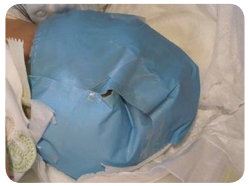
At the first review by the Tissue Viability nurses it was noted that the sac had desiccated and contracted.

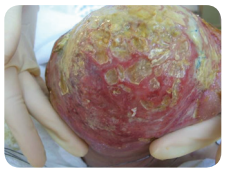
The condition of the wound upon closer assessment included evidence of granulation to the margins with a thick sloughy layer to the top of the abdomen with a necrotic umbilicus. The wound had some malodour and was producing greenish exudate on the dressings, which is indicative of a gram negative infection. Microbiology results at the time showed a polymicrobial infection, including klebsiella, staphylococcus aureus and candida. There was some maceration and inflammation of the surrounding tissue.

Intervention

Activon Tulle® was introduced along with Eclypse®. This dressing regime was chosen based on an assessment of the wound conditions by the Tissue Viability Team along with literature available on the use of advanced wound care products in pre-term infants. Relevant antibiotics were administered intravenously to manage the polymicrobial wound infections.





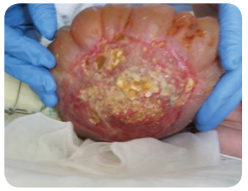


The first dressing change was 48 hours after the start of the new treatment by the Tissue Viability Team. The thick layer of slough was becoming loose and was showing signs of autolysis.

After 7 days from the inception of treatment the wound became less sloughy with more granulation occurring and some re-epithelization. The wound treatment continued, the dressings were changed 48-hourly and the wound continued to progress positively. As the neonate grew and increased in size it was expected that the abdominal defect will reduce in surface area as the abdomen will be able to accommodate the exomphalos.

Results

Within the first 7 days of treatment there were positive changes to the wound bed. There was a 50% reduction in non-viable tissue to the exomphalos. There was a marked reduction in the inflammation of surrounding tissue. The wound edges appeared to be less prominent and with less maceration due to better exudate management.



Three weeks after the treatment started the wound surface area began to decrease in size. The wound edges became very oedematous; however this was due to other underlying medical complication.

Discussion

The use of honey in wound management is well documented in history and is an ancient wound remedy. More recently medical professionals are using Medical Grade honey in a variety of chronic and acute wounds. The positive attributes of Activon Tulle® and indication

for use in this case study included facilitating wound debridement and also providing antimicrobial cover which was necessary in Baby Blue's wound care management. It suppressed inflammation and stimulated tissue growth and at the same time provided a deodorising effect. (Molan, 1999).

One of the main concerns regarding the use of honey in the neonate population is botulism. Botulinum toxin is derived from clostridium botulinum spores that can exist in deep wound cavities in an anaerobic environment. These spores are occasionally found in honey products. Botulism can lead to paralysis and cardiac arrhythmia that is related to the systemic effects of the toxin. The Activon® Tulle used in Baby Blue's management was gamma-irradiated to inactivate spores, such as those from clostridium (Simon et al 2009). The irradiation process does not have a detrimental effect on the antibacterial activity of the honey (Molan & Allen, 1996).

The use of Activon® Tulle as a primary dressing to the major exomphalos managed the infection risk due to its antimicrobial properties, while facilitating autolysis of non-viable tissue and suppressing inflammation. This allowed for effective wound-bed preparation and stimulated tissue growth.

The use of a super absorbent pad as the secondary dressing allowed for effective exudate management; maceration to the surrounding skin improved and the risk of excoriation was reduced.

There is limited published evidence to support advanced wound care in the neonate population. The use of Activon® Tulle in this case study demonstrated that it can be a safe treatment option despite the lack of published evidence.

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Activon® Tulle, Eclypse® non-adherent, Advancis Medical.

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