

SIMULTANEOUS ADVANCEMENT FLAP UMBILICOPLASTY AND OMPHALOCELE REPAIR

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Umbilical reconstruction commonly is an adjunct used after repair of congenital abdominal wall defects. Here, I describe a technique of umbilicoplasty for newborns with small and medium sized omphalocele, and compare the results with the normal neonatal umbilical anatomy. After reducing the contents and fascial closure, 5 newborns underwent umbilicoplasty performed by advancing bilateral skin flaps including creation of an umbilical skin collar. The umbilical collar height, circumference, and distance from the xiphoid with respect to the pubis (ratio of xiphoid-umbilicus distance to xiphoid-pubis distance or XU: XP) were recorded and referenced to the normal umbilical anatomy in additional 24 newborns (age 1 to 30 days [mean, 12 days]). After umbilicoplasty, all infants had a near normal appearing umbilicus (collar height, 0.7 ± 0.2 cm and circumference, 5.1 ± 1.3 cm) compared with normal umbilical anatomy (collar height, 1 ± 0.25 cm and circumference 4.5 ± 1.2 cm). However, after umbilicoplasty, the neoumbilicus was positioned slightly more cephalic (XU: XP = 0.61 ± 0.05) compared with normal (mean XU: XP, 0.67 ± 0.07). No major complications have occurred; minor complications included delayed wound healing in one case and decreased umbilical depth in one infant. All of the parents have been satisfied with the results of umbilical reconstruction.

Key Words Omphalocele repair

INTRODUCTION

Exomphalos is herniation of some of the intra-abdominal contents through the opened umbilical ring into the base of the umbilical cord. It differs from umbilical hernia in that the protrusion is covered not by skin but by a translucent avascular membrane consisting of peritoneum inside and amniotic membrane outside separated by a thin layer of Wharton jelly⁽¹⁾.

Small exomphalos is usually regarded as a failure of complete return of the intestine after its normal period of herniation into the extraembryonic coelom with secondary failure of closure of the umbilical ring⁽²⁾. Ravitch suggested that the basic defect could be a deficiency of ventral midline mesenchyme into which the mesodermal structures would normally grow⁽³⁾.

Exomphalos is not a rare anomaly; its incidence recorded to be varies from 1 in 3200 to 1 in 2280⁽¹⁾. Ambroise Pare [1510-1590] gave the earliest report of this malformation and stressed the serious nature of the condition and the poor prognosis⁽¹⁾.

Moore suggested a classification of omphalocele into types 1, 2 and 3 with the diameters of < 2.5cm, 2.5 to 5 cm and > 5 cm respectively. Although the recording of defect diameter is an important part of the documentation of a case of exomphalos it is also important to record the greatest diameter of the sac since this may be considerably greater than the diameter of its neck⁽⁴⁾.

Abdominal wall defects require complete reduction of herniated viscera as soon as technically feasible after birth. Primary reduction with fascial and skin closure is the ideal method if possible⁽⁵⁾. Creation of a cosmetically appearing umbilicus in patients who can undergo primary closure of an omphalocele remains a challenging problem. Most techniques used today result in a less than satisfactory cosmetic appearance to the resulting umbilicus and may cause unnecessary embarrassment to the patient and his or her parents^(6,7,8). The normal umbilical position is 60% of the way from the inferior border of the xiphisternum to the superior border of the pubis in the midline⁽⁹⁾.

In this study, a technique of primary closure of fascia

and skin was used. Umbilicoplasty was performed at the same time using superiolaterally based bilateral advancement skin flaps.

PATIENTS AND METHODS

Five newborn infants presented with small and medium size omphalocele (defects was not more than 5 cm) fig (1) underwent immediate primary closure after reduction of herniated viscera.

Preoperative preparation:

As rapid as possible the drag on the mesentery was reduced by supporting the weight of the bowel on bulky packs of warm sterile wet gauze. A number 10 FG nasogastric catheter was passed as soon as possible and aspiration was done by syringe at 10 min. intervals to prevent vomiting and to keep the bowel decompressed. Any hypovolemia, hypothermia or acidosis was corrected prior to surgery. Prophylactic cefotaxim sodium (100 mg/kg/day) was given at the time of admission and continued to the third postoperative day. The abdominal wall was prepared with 10% povidone iodine solution.

Operative technique:

Circumferential incision around the omphalocele sac and rim of the skin was made (Fig 2). The abdominal wall skin was mobilized off the underlying fascia in a fan-shaped fashion superior and lateral to the fascial defect (Fig 3). Small and large bowel was examined for atresia after incision of the sac (Fig 4). Excision of the sac with preservation of the umbilical cord remnants, which will

contribute to the final cosmetic appearance (Fig 5). Manual stretching of the abdominal cavity was always necessary in these babies to accommodate the viscera. The optimal site of the proposed neoumbilicus was determined as low as possible in the wound. The umbilical collar height was also recorded at this time. The final circumference of the periumbilical skin surrounding the umbilical cord remnants was determined and marked. The flaps and as much of the subcutaneous fat as possible was then undermined up to 2 cm beyond the fascial ring. The peritoneum and fascia were approximated and the umbilical cord preserved to contribute to the final cosmetic appearance (Fig 6). The umbilical cord remnant was then placed as low as possible in the defect to avoid the final high position of the neoumbilicus (Fig. 7). Then bilateral symmetric wedges of skin were marked with the superior apex positioned just cephalic to the closed fascia and remaining skin defect. The base of the wedges was used for creating the umbilical collar (Fig 8). The base incisions were made at a perpendicular angle to the midline and were slightly longer than the measured periumbilical skin collar height for expecting normal wound contracture. After excision of the wedges, the lateral angles of the bases were approximated with an inverted 4/0 vicryl suture (Fig 9). Mobilized skin flaps are then approximated at the midline with sutures, and the previously created base incisions are approximated to create the periumbilical skin collar (Fig 10). Antibiotic ointment is placed on the umbilical wound for several days followed by routine wound care.



Fig (1) omphalocele defect less than 5 cm



Fig (2) circum-ferential incision



Fig (3) skin was mobilized

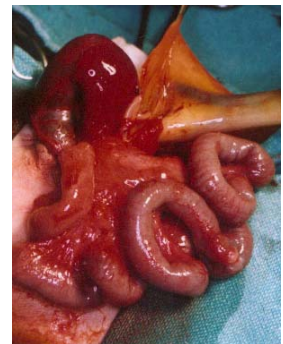


Fig (4) incision of the sac



Fig. (5): excision of the sac with preservation of the umbilical cord remnants



Fig. (6): the peritoneum and fascia were approximated

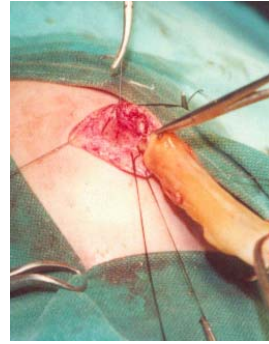


Fig. (7): the umbilical cord remnant was placed as low as possible

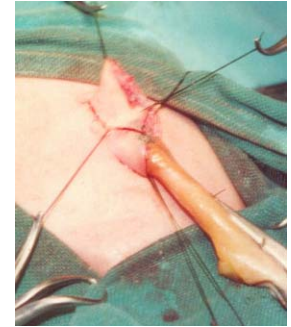


Fig. (8): bilateral symmetric wedges of skin were marked



Fig. (9): lateral angles of the bases were approximated



Fig. (10): skin flaps are approximated at the midline

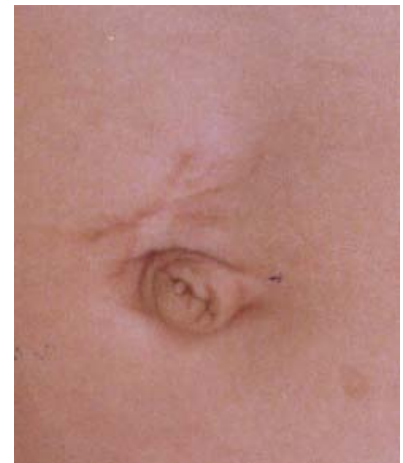


Fig. (11): 6 months postoperative

The umbilical collar height, circumference, and distance from the xiphoid with respect to the pubis (ratio of xiphoid-umbilicus distance to xiphoid-pubis distance or XU: XP) were recorded and referenced to the normal umbilical anatomy in additional 24 newborns (age 1 to 30 days [mean, 12 days]). Mean follow-up was 6 months (range, 2 to 13 months).

RESULTS

All newborns had successful abdominal wall closure and simultaneous umbilicoplasty. No major complications have occurred; minor complications have included delayed wound healing in one case and decreased umbilical depth in one infant. All of the parents have been satisfied with the results of umbilical reconstruction. After umbilicoplasty, all newborns had a near-normal-appearing umbilicus (collar

height, 0.7 ± 0.2 cm and circumference, 5.1 ± 1.3 cm); however, the umbilicus was positioned slightly more cephalic (XU: XP = 0.61 ± 0.05) compared with normal umbilical anatomy. Normal umbilical anatomy showed that the mean umbilical collar height and circumference was 1 ± 0.25 cm and 4.5 ± 1.2 cm, respectively. The umbilicus was positioned two thirds of the distance from the xiphoid to the pubis (mean XU: XP = 0.67 ± 0.07). (Fig 11) shows 6 months postoperative result, with near normal appearing umbilicus and small unnoticed supraumbilical scar.

DISCUSSION

Although umbilicus is not essential for life, its presence has the greatest importance in abdominal cosmetic appearance especially in females. In the past, primary facial

closure often left a prominent mid abdominal scar and an absent umbilicus, which may cause some embarrassment to the child and his or her parents⁽³⁾. Many methods were used to recreate the umbilicus after closure of the omphalocele. These techniques require either bunching of the skin with a circumferential purse string suture, which is not cosmetic or are limited to small defects^(6,7,8,10,11,12). Furthermore, results of such techniques have not been compared objectively with normal neonatal umbilical anatomy. Advancement flap umbilicoplasty adds only little extra operative time to the procedure. If additional exposure is required, the skin defect can be elongated downward along the midline before creating the wedge shaped skin flaps. This is to avoid the cephalic position of the neoumbilicus as the normal neonatal umbilicus is positioned two thirds of the distance from the xiphoid to the pubis (mean XU: XP=0.67+0.07).

So it can be concluded that the closure of the abdominal wall defects with simultaneous advancement flap umbilicoplasty provided a cosmetic results. Periumbilical skin collar height and circumference of the neoumbilicus were nearly similar compared with normal neonatal anatomy. Advancement flap umbilicoplasty may be used adding little extra time to the procedure. The small linear midline supraumbilical scar is not prominent.

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