

## Peritoneal Injuries in Open Umbilical Vein Cannulation: Do We Explore More than Needed

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### Abstract

*Purpose:* To determine the efficacy of routine exploration in peritoneal injuries occurring as a complication of neonatal umbilical vein cannulation. *Methods:* Twenty patients who had peritoneal breach during umbilical vein cannulation were included. They were divided randomly into two groups. Ten patients (Group A) underwent exploration and ten patients (Group B) were under observation following peritoneal suturing. The results were compared in terms of outcome. *Results:* There was no difference in the outcomes of the two groups. *Conclusion:* Serial observation after suturing of the peritoneal defect may be attempted as a method in dealing with peritoneal breach without any bowel protrusion.

**Keywords:** Umbilical Cannulation; Peritoneal Injuries; Umbilical Vein; Surgery; Suturing.

### Introduction

Cannulation of the umbilical vein has been often used as a life saving method to gain vascular access in newborns. It is often difficult to cannulate the peripheral veins, especially in preterms. The umbilical vein may be used as a venous access to support the neonate [1,2]. In term neonates, the most common other indication for cannulation is double volume exchange transfusion. DVET is performed in hyperbilirubinemia not reduced by phototherapy [2,3]. There are two methods to cannulate the umbilical vein. In the closed technique, the catheter

is inserted through the umbilicus after separating the folds. This can be done upto an age of seven or eight live days [4,5]. In older neonates, it is not possible to view the vein as it progressively shrinks. In these patients, an incision is given supra umbilically to separate the layers of the abdominal wall and cannulate the umbilical vein under vision. After separation of the subcutaneous tissues, the vein is carefully dissected and lifted off similar to the classical venesection technique. An incision is given transversely in the lumen and the cannula inserted. A major complication of this open technique has been inadvertent opening of the abdominal cavity. Usually, there is minimal peritoneal injury with no bowel protrusion. The classical teaching has been to explore the abdomen if there is a peritoneal breach, even if there is no bowel protrusion [2,5,6]. We have attempted to modify this protocol in certain cases, preventing unwanted laparotomies and morbidities.

### Materials and Methods

The study was conducted at the Department of Pediatric Surgery, SMS Medical College, Jaipur. Twenty patients were included in the study. The selection criteria was limited to patients who underwent umbilical vein cannulation but had a peritoneal breach. There was no bowel protrusion. Ten patients (Group A) underwent exploration and search for any injury or perforation. The remaining patients (Group B) had suturing of the peritoneal defect using absorbable continuous sutures. No search was made for any intraperitoneal injuries. Both groups were observed for signs of peritonitis, sepsis and time to oral feed. The results were compared.

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## Results

The results showed that the values between the two groups were largely comparable. The patients in Group A who underwent exploration had 30% risk of peritonitis. This value was 10% in Group B (Table 1). The patient who developed peritonitis was subsequently explored for the cause. This result showed that mere observation with closure of the peritoneal defect did not increase the risk of developing perforation or peritonitis in the neonate.

Further, the course of patients in Group B was more favourable due to non handling of gut during the procedure. Features of sepsis and fever was comparable in the two groups. One patient in each group developed signs of sepsis and was managed accordingly (Table 2). It was interesting that patients in Group B had a shorter time to oral feed. The mean duration to oral intake was 5.7 days in Group A and 2.7 days in Group B. This value also relates to the excess bowel handling in patients undergoing exploration and post surgery ileus. There was no mortality during the course of the study.

**Table 1:** Neonates presenting with signs of peritonitis

Peritonitis	Group A (n=10)	Group B (n=10)
Present	03 (30%)	01 (10%)
Absent	07 (70%)	09 (90%)

**Table 2:** Neonates presenting with features of sepsis

Sepsis	Group A (n=10)	Group B (n=10)
Present	01 (10%)	01 (10%)
Absent	09 (90%)	09 (90%)

**Table 3:** Mean duration to oral feed

Time to Oral Feed	Group A	Group B
Mean duration	5.7 days	2.7 days

## Discussion

Unwanted laparotomies are always uncalled for. Umbilical vein cannulation is itself a meticulous procedure with lots of complications following it. Serious events like hepatic abscess, air embolism, catheter sepsis and portal vein thrombosis may result from it [7,8]. Careful dissection of the vein from its bed with selective cannulation is important. The commonest complication has always been a peritoneal breach which transfers the patient to the surgical emergency [3,8,9]. Classically, patients have undergone laparotomies with search for the injury or gut perforation. However, in patients with peritoneal breach where there is no bowel protrusion, mere suturing of the peritoneum with absorbable suture is a better alternative. Our study results state that there is no further risk in managing these patients by peritoneal suturing. Patients should be observed for development of signs of peritonitis, sepsis which indicate need for surgical intervention. As seen, one patient in Group B did undergo exploration for peritonitis. A meticulous follow up of patients with monitoring of vital signs is necessary.

## Conclusion

We conclude that simple suturing of the peritoneum in cases where there is no bowel

protrusion following peritoneal injury is safe, effective and prevents unwanted surgeries. The monitoring should be proper and meticulous with index of suspicion for development of signs of peritonitis.

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