

## A Study to Evaluate the Outcome of Umbilical Hernia Anatomical Repair with both Intermittent and Continuous Polypropylene Suture

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### How to cite this article:

Suresh B.P., Madhukar Naidu, Sachin H.G. A Study to Evaluate the Outcome of Umbilical Hernia Anatomical Repair with both Intermittent and Continuous Polypropylene Suture. New Indian J Surg. 2018;9(3):362-65.

### Abstract

**Background:** About 10% of all the abdominal primary hernias consists of umbilical and para umbilical hernia [1]. Earliest literature of umbilical hernia with its complication dates back to 1500 BC. In 1915, Dr. Moschcowitz authored an article regarding the aetiology of development of umbilical hernias, in which he suggested the pathogenesis related to the anatomical weakness at umbilicus [2]. Predisposing factors include obesity, multiple pregnancies, ascites, abdominal tumours, smoking [3]. Umbilical hernias have tendency to be associated with risk of incarceration and strangulation. Umbilical hernias can be repaired anatomically or using mesh repair, either with open repair or laparoscopic repair. In the present study we used anatomical repair method to close the defect using polypropylene suture material using both intermittent and continuous sutures. **Methods:** Study included 25 patients with primary uncomplicated umbilical hernia who underwent anatomical hernia repair using polypropylene suture with intermittent and continuous suturing technique in all the patients. Patients followed up for a period of August 2012-August 2017. **Results:** Patients were followed up at 1 week, 1 month and 6 months period. We found success rate of 100% with no recurrence in 6 months follow up period. 12% of patients had wound seroma formation (3/25), and 8% of patients had wound infection (2/25). Mild pain was seen in 16% of patients till period of 1 month (4/2). **Conclusion:** The method we followed to close the

umbilical hernia defect by anatomical repair with horizontal closure using polypropylene suture with both continuous and intermittent suturing technique had a double surety of the secured closure and the outcome had almost similar results as mesh closure technique with 100% success rate.

**Keywords:** Umbilical hernia; Polypropylene; Primary repair

### Introduction

Umbilical ring is a complex structure related to linea alba, falciform ligament, obliterated urachus. Umbilical hernia is a common surgical problem. It can be congenital in newborn and infants or acquired in adults. It can also be associated with ascites, Down syndrome. These are generally asymptomatic protrusions of abdominal wall and pain is the main complaint [4] which leads the patient to consult. Radiological and physical examinations can find umbilical hernias in 23-50% of adult population. Primary umbilical hernia can also present with acute complications of strangulation and incarceration.

Primary repair of umbilical hernia refers to suture repair without use of prosthetic material. This can be done with permanent, short acting long acting sutures or monofilament, multifilament sutures. Defect can be closed vertically or horizontally. Despite of the era of mesh repair, Norway and Sweden countries use the primary anatomical repair in 70-77% of the patients [5,6]. Initially simple opposition of defect edges were followed and several comparative studies were done on animal models like rabbit [7] with single layer vs, multilayers. Dr. Mayo introduced repair technique

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Received on 08.03.2018, Accepted on 02.04.2018

using “pants over vest” manner, and also subsequently found closing the defect transversely helped to close larger defects as tension was generally less in transverse closure [8].

All type of anaesthesia (SA, GA, LA) are suitable for the repair. As umbilical region is naturally not a clean part of the body, proper preparation of parts and good antibiotic prophylaxis need to be covered. Despite of this techniques 10% chances of local wound infection is common post operatively. Post-operative pain, seroma, wound infections, suture abscess are the possible complications. Incisional hernia and recurrence are more morbid complications. Anatomical repair was tried in all the sample cases with polypropylene suture, with all patients underwent closure of defect edge both with intermittent and continuous closure techniques.

**Methodology**

All cases of umbilical hernia are treated at Subbiah Medical College Hospital and Research Institute, Shimoga between Aug 2012-Aug 2017.

*Inclusion Criteria*

- More than 18 years of age included
- Primary umbilical hernia included both male and female

*Exclusion Criteria*

- Incisional and recurrent hernia
- Paediatric umbilical hernia
- Hernia presented with complications and emergencies

*Demography* with the demographic profile and statistics following points are evident.

**Table 1:** Age of the patient

Age of the patient	No of patients	Percentage
18-27	01	04
28-37	07	28
38-47	09	36
48-57	04	16
58 and above	04	16
Total	25	100

**Table 2:** Male female ratio

	No. of patients	Percentage
Male patients	08	32
Female patients	17	68
Total	25	100

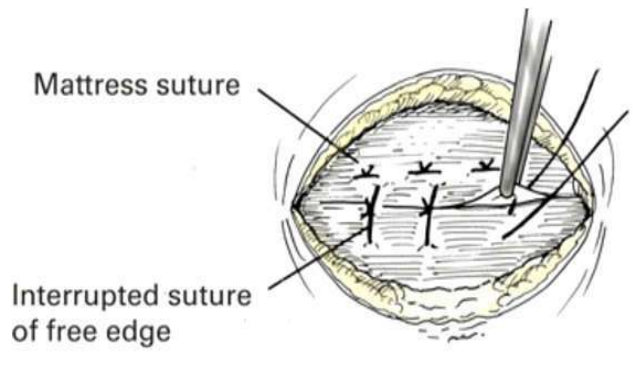
**Table 3:** Table Outcome

Complications	No of patients	Percentage
Seroma	03	12
Wound infection	02	08
Post op pain (1 month)	04	16

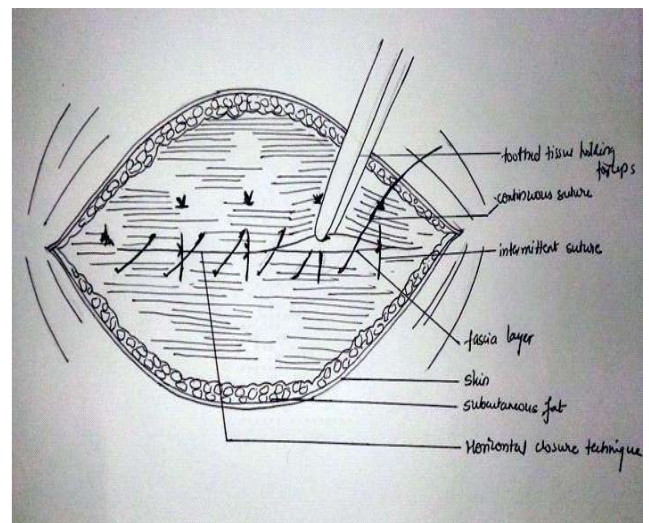
*Recurrence*—nil recurrence



**Fig. 1:** Horizontal closure of umbilical hernia defect with prolene continuous suturing



**Fig. 2:** Horizontal approximation of umbilical hernia defect with intermittent mattress sutures



**Fig. 3:** Technique of horizontal closure of fascia and defect with both intermittent and continuous suturing using polypropylene suture material

## Results

Twenty five patients were included in the study, out of them 17 patients were females and 8 were males. All surgeries were done under spinal anaesthesia. Patients covered with prophylactic and post-operative antibiotics. All 25 patients were followed up for a period of 6 months Starting from the post-operative day 7 (1 week), 1 month and 6 months.

With the above reports and observations it is evident that out of 25 patients who underwent the procedure of umbilical hernia anatomical repair both using the continuous and intermittent polypropylene sutures:

All patients underwent the horizontal closure of fascial layers, romovac suction drain placed in 18 patients (70%) and rest 7 were closed without using the drain (30%). 2 cases were encountered with wound infection and 3 cases with seroma formation and no patients had chronic post-operative pain and recurrence of hernia. Umbilicus preserved in all the patients and sutured by inversion and no patient had umbilical necrosis.

Patients were followed up at 1 week, 1 month and 6 months period. we found success rate of 100% with no recurrence in 6 months follow up period. 12% of patients had wound seroma formation (3/25), and 8% of patients had wound infection (2/25). Mild pain was seen in 16% of patients till 1 month of period (4/25).

With the above results it was found that anatomical repair with polypropylene suture using both intermittent suture and continuous suturing (combined) were found more effective as compared to the individual techniques.

## Discussion

In the study we have done, anatomical repair of umbilical hernia using polypropylene sutures using both continuous and intermittent suturing techniques. All cases underwent horizontal closure of the anatomical defect. Mayo's technique of closure had near to 28% of recurrences rates [9]. High recurrences were noted in other studies also [10]. Paul et al. reported the recurrence rate of 54% among 114 patients who underwent Mayo's closure technique with continuous closure with 5.7yr. follow up.

Normally the intermittent suture used to close the fascial defect had more chances of failure. Some studies proved the effectiveness of the continuous sutures over interrupted [11]. Many studies have compared the continuous vs intermittent closure techniques based on the surgery time, suture material used, post op pain and infection [12,13]. Study done by Paul A, Peters S et al. shown that intermittent simple suturing technique closure has shown the recurrence rate up to 54% [14,15].

Studies done by Halm JA, Veen HF et al. had an outcome of results with 14% recurrence rates with continuous suture technique alone [16,17].

In Indian set up most of the patients presenting at the outpatient are females. Post-operative advice given to avoid the strenuous jobs, heavy weight lifting works to ensure zero percent recurrence rate. Despite of that A) because of lack of knowledge of consequences, B) illiteracy, C) lost follow ups D) inaccessibility to health care centre, and E) early return to normal or heavy works chances of recurrences were found increasing exponentially.

So we exerted a plan to close the umbilical hernia using both continuous and intermittent techniques, to ensure the double confirmation of secured repair, if in case the follow up is lost because of above mentioned reasons. The idea was to retain the intermittent sutures even though the continuous sutures give away.

## Conclusion

The method we followed to close the umbilical hernia defect by anatomical repair with horizontal closure using prolene suture with both continuous and intermittent suturing technique had a double surety of the secured closure and the outcome had similar results as mesh closure technique with 100% success rate.

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