

# Postoperative Wound Closure and Cosmetic Outcomes of Sutures and Staplers in Thyroid Surgery at Tertiary Care Hospital

Closure and  
Cosmetic  
Outcomes in  
Thyroid Surgery

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## ABSTRACT

**Objective:** To detect the best material used in order to get least postoperative complications and good cosmetic results for restoring the normal anatomy of affected organ.

**Study Design:** Comparative study.

**Place and Duration of Study:** This study was conducted at the Surgical Department of PMCH, Nawabshah from December 2016 to November 2018.

**Materials and Methods:** All the patients were admitted from Surgical OPD and Emergency department.

**Results:** Total 45 patients were included in this study. Of them, Prolene was used in 20 (44.4%) patients, Mersilk in 15 (33.3%) and Staplers in 10 (22.2%) patients.

**Conclusion:** Polypropylene was the best suture with good results keeping in view the postoperative complications and cosmetic outcomes.

**Key Words:** Polypropylene, Staplers, Cosmetic, Suture

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## INTRODUCTION

It is an accepted fact that every human wants to be looked beautiful so there is dire need of good aesthetic outcomes even after surgical trauma to body. The role of cosmeses has always been a part of surgeries in all surgical fields. This is the fact that there is increase in conversion of open surgeries to laparoscopic, tans abdominal (scar less), SILS (single incision laparoscopic surgeries) and also the endoscopic procedures. These procedures produce fewer scars. Despite all these advancements, the role of sutures, staplers and glues play same role in context of cosmeses.

The surgeries performed for thyroid and parathyroid glands are important cosmetically for women and young adults. The incision for these procedures is highly sensitive as anatomic location is visible. So the sutures used for these methods are performed keeping in view the cosmetic concern. Suture material still occupies significant place in this regard.<sup>1,2</sup>

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There are three methods of skin closure viz staples, sutures and skin adhesives. Sutures are still in common usage for wound closure due to their easy access, usage and efficiency. It also provides mechanical support for the closure of wound. Moreover, different varieties of sutures are available for surgeons to choose keeping in view the type of wound to close.<sup>3</sup>

Surgical suture is the material for holding the body tissues together after the non surgical or surgical trauma. It is done with help of different types of needles having threads at their back. The needles have variety of shapes and size along with threads. Knots are usually used to secure the sutures.<sup>4,5</sup>The use of surgical suture dates back to 3000 BC in ancient Egypt. The suture in mummy in 1100 BC is the known to be the oldest one. Hippocrates, known as father of medicine, invented the suture technique. Galen invented the Gut sutures in 2<sup>nd</sup> century and Abulcasis unveiled catgut suture along with needle in 10<sup>th</sup> century. Sterile catgut was discovered in 1906 with iodine treatment. The revolution in suture material came in 20<sup>th</sup> century when 1<sup>st</sup> synthetic thread was produced in 1930s. polyesters were discovered in the 1950s and polyglycolic acid in 1960s. Nowadays, most of threads are made of synthetic polymer fibers. Gut sutures are not used in Europe because of developing Bovine Spongiform Encephalopathy. Silk suture is still in use but limited.<sup>6</sup>

Each suture has its different characteristics and functions. They have different filament structure, size, degradation capability, tensile strength, surface texture, stiffness and flexibility of the materials. The capability of sutures to bear the tissues induced stress and the capability of repair is dependent on its size and tensile

strength. The balance between the tensile strength of suture as well as tissues is imperative for better healing of wound.<sup>7</sup>

Sutures are made of two types of materials viz absorbable and non absorbable. Absorbable sutures degrade by losing their 50% of tensile strength usually within 60 days whereas non absorbable sutures can retain their tensile strength more than 60 days. Absorbable sutures include the catgut, polyglycolic acid, polylactic acid, polydioxanone and caprolactone. Naturally derived absorbable sutures are absorbed within 70 days by proteolysis of enzymes. Synthetic absorbable sutures degrade by hydrolysis whereas non absorbable sutures degrade poorly. Non absorbable sutures are composed of silk or polypropylene, polyester or nylon. Neither do they undergo enzymatic digestion nor hydrolytic process and is removed physically. These are commonly used on skin for wound closure and are removed after one to two weeks. They develop least scar as they usually provoke diminished immune response. Various substitutes have been introduced recently like glues, staples and strips in market but these are lacking in stability and flexibility which is only found in sutures in wound healing.<sup>8</sup>

Multiples techniques are used for sutures usage. These are simple interrupted stitch, vertical and horizontal mattress stitch, purse string suture, figure 8 stitch and subcuticular stitch. Staples and glues are also used for wound closure.<sup>9</sup> The time of removal of sutures vary with regard to body parts. Facial wounds are removed within 3-5 days where as scalp wounds are freed on 7-10 days. Joints stitches are out on 14<sup>th</sup> day whereas of trunk of the body on 7-10 days.<sup>10</sup>

Staples are deemed to be good because they are applied quickly and easily for skin closure but some authors have discouraged their use because of the more vulnerability to develop infection and scars. These have also enhanced tension along the line of incision so it is not appropriate for reconstructive flap surgery. They can be used for closure of long incisions. But the advantage of staples over sutures is their speed of closing wound. The worst disadvantage of staples is the creation of wound gaping if dermal margins are not accurate producing eversion or inversion.<sup>11</sup> The rationale of our study is to find out the better method of skin closure for the purpose of cosmeses of patient so that the natural beauty of human could be maintained.

## MATERIALS AND METHODS

This is comparative study conducted at surgical department of PMC Hospital Nawabshah from December 2016 to November 2018. Total 45 patients were included in this study. All the patients were admitted from Surgical OPD and Emergency Department of Peoples Medical College Hospital Nawabshah after getting their thyroid profile results. Patients admitted were Euthyroid. Hypothyroid and

Hyperthyroid patients were excluded from this study and treated conservatively. Thorough History and Clinical examination was done. Local examination of Neck was also done to exclude any toxic element. Routine blood investigations were done. X ray and Ultrasound of chest was done to rule out retrosternal extension. Laryngoscope was done by ENT department to exclude preoperative assessment of tonsils. Cardiac and Anesthesia fitness was gotten for Surgery. Patients were shifted to Operation Theater. After thyroidectomy, skin closure was done by Mersilk#1, Proline#0,1, 2/0, and also the Staplers. Patients were shifted to Ward for the postoperative management. On operative and postoperative days, wound was examined for postoperative hematoma. On 5<sup>th</sup> postoperative, patients were discharged, called on 10<sup>th</sup> postoperative day for follow up, then finally on 3<sup>rd</sup> month to compare the wound position of neck cosmetically.

## RESULTS

Total 45 patients were included in this study. Of 45, Proline#0,1,2/0 was used in 20 (44.4%), mersilk#1 in 15 (33.3%) patients and Stapler in 10 (22.2%) patients only as is shown in Table 1. Out of 20 patients, 7 (15.5%) patients skin closure was done by proline#1, 7 (15.5%) by Proline#0 and 6 (13.3%) with Proline#2/0. Mersilk#1 was used in 15 (33.3%) patients whereas stapler was applied in only 10 (22.3%) patients only.

On 10<sup>th</sup> day and 3<sup>rd</sup> month postoperatively, patients' wounds were examined for complications and cosmeses respectively. 4 (8.8%) out of 15 patients used silk for skin closure came with infected wound and 1 patient with wound dehiscence. 2(4.4%) patients out of 10 closed with stapler developed infection in wound. Of total 20 patients, only 1 (2.2%) patient developed minor infection in wound. Increased pain in wounds was noted in patients with staples. 1(2.2%) patient with stapler usage developed wound dehiscence but no any case was reported by usage of proline. 2(4.4%) patients developed granuloma after use of proline but none developed stitch granuloma after silk and stapler usage. Cosmetically, patients with proline use resulted in excellent scar, silk with good scar.

■ Proline 20 (44.4%) ■ Mersilk 15 (33.3%) ■ Stapler 10 (22.3%)

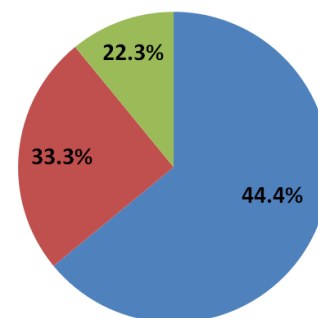


Chart No.1: Patients details

**Table No. 1: Type of Thread**

S.No	Type of Thread	No of Patients	Percentage
1	Proline#1	7	15.5%
2	Proline#0	7	15.5%
3	Proline#2/0	6	13.4%
4	Mersilk#1	15	33.3%
5	Stapler	10	22.3%
Total		45	100%

**Table No. 2: Complications**

Complications	No of patients Prolene use	Mersilk used	Stapler use
Wound infection	1	4	2
Wound dehiscence	0	1	1
Stitch granuloma	2	0	0
Cosmosis	Excellent scar	Good scar	
Abscess formation	0	1	1

The sutures were assessed by use of POSAS (Patient and Observer assessment Scale). On the basis of this scale, wound is assessed by observer and patient's opinion about wound.

## DISCUSSION

Stapling and suturing are two different techniques with different outcomes. They require care to be employed. Though staplers are easier to apply in skin closure with speedy execution over wound skin but the disadvantage is the cost of staplers. Cosmetically stapling produces no good scar as is produced by polypropylene within 3 months of surgery.<sup>12</sup>

A prospective trail showed stapler as superior than sutures but this is opposite to our study as proline proved to be superior to staplers. Some authors have suggested the increased risk of wound infection and big scar with use of stapler. Our study showed increased infection in wound by use of mersilk.<sup>13</sup>

Stapler advantages are that the skin closure is easy and speedy. At the time of stitch removal, minimum pain is observed while removing stapler as compared to mersilk. Stapler are costly as compared to proline and silk.<sup>14</sup>

A study conducted on orthopedic surgery concluded the risk of posoperative infection three times more by use of staplers as compared to conventional stures but in our study, increased infection is associated with use of mersilk. Frel et al assessed two conventional sutures polyglactin and polypropylene after carpal tunnel decompression. This study concluded the increased inflammation of wound and increase pain in wound after use of polyglactin and polypropylene respectively.

In our study, no increased pain in wound was noted after use of polypropylene.<sup>15</sup>

Another study concluded that patients complained of discomfort at time of polypropylene stitch removal. Same was also noted in our study. One study compared catgut and polypropylene for skin repair and concluded the catgut superior to polypropylene but our study made polypropylene subcuticular use superior to all sutures and staplers. This resulted in excellent scar with slightly visible stitch marks. Multiple studies conducted on use of absorbable and non absorbable sutures showed no any difference with regard to complications and cosmeses. But in our study, difference in results is found even among two non absorbable sutures viz polypropylene and Mersilk.<sup>16</sup>

A study conducted in Rawalpindi has dramatically recommended the use of polyglactin for darn repair of hernia after comparison of two sutures viz polyglactin and polypropylene. But our study shows polypropylene as the best with least complications and excellent cosmetic results.<sup>17</sup>.

## CONCLUSION

Our study concluded that polypropylene is the best suture with least postoperative complications and excellent cosmetic result in thyroid surgeries.

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**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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