Hernia surgery is one of the common surgeries performed in rural areas. There is significant difference between the incidence and treatment of hernia between the western world and the Low and Middle Income Countries. For example an estimate in East Africa said that there would be a minimum of 175 hernia surgeries per 100000 populations a year and 30 of them would present with strangulation or incarceration. In Uganda it was found that operating at 17 per 100000 populations almost 10% of the men had scars of hernia treatment.

The lifetime risk of having a hernia is 27% for men and 3% for women and hence it is an old surgical condition diagnosed by the Egyptians, Phoenicians and Greeks even before Christ. The mummies of the Pharaoh’s Merneptah (1215 BC) and Ramses V (1157 BC) showed evidence of hernia.
The father of modern Hernia surgery is E Bassini. Between 1883 and 1889 he did 274 hernia repairs with 4% recurrence and 5% wound infection. Even now his technique is compared with other techniques in Randomized Control Trials. Halstead, Marci and Shouldice later described their modifications.

Shouldice reduced the recurrence to 1% and Lichtenstein further reduced it to 0.7%. In the sixties Richard Newman popularized the use of Prolene mesh for hernia repair.

In contrast to Bassini’s repair, which proved essentially useful in direct hernia, Marcy’s technique was particularly indicated in indirect hernia. His compatriots William Halsted (1852-1922), Edmund Andrews (1824-1904) and Alexander Ferguson (1853-1912) all made some adaptations to Marcy’s original technique, and combined it with Bassini’s technique, so as to fit the procedure for both direct and indirect hernias. An original new method of posterior inguinal wall repair, already suggested by Albert Narath (1864-1924) and in 1898 followed by the Austrian Georg Lotheissen (1868-1935), consisted of using the pectineal ligament of Cooper for repair. This technique got great acceptance after its reintroduction in 1949 by Chester McVay (1911-1987) and Barry Anson (1894-1874). However McVay’s postoperative low recurrence rates were never matched by other groups.

There are three landmarks in the history of repair of inguinal hernia:

1. Tissue repair Eduardo Bassini 1888
2. Onlay mesh Irving Lichtenstein 1984 (tension-free) repair
3. Laparoscopic Ger, Shultz, hernia repair Corbitt etc 1990
The idea of repair of inguinal hernia from the posterior or pre-peritoneal side was suggested as early as 1743 by Bates and popularized by Stoppa in France. The concept of tension free repair and IPOM [Intraperitoneal Onlay Mesh] now is considered the best option for hernia repair.

WHY NOT LAPAROSCOPIC SURGERIES?

If laparoscopic surgery for inguinal hernia is so good, why is not everyone doing it? For several reasons, unlike laparoscopic cholecystectomy, which had a market penetration of 93% within 3 years, laparoscopic hernia repairs after 16 years has enjoyed or rather suffered, a market penetration of 5-15% in the developed world. Given the added benefit of reduced pain and early mobilization it is a good procedure in expert hands.

The National Institute for Health and Care excellence in UK recommends the procedure by trained surgeons ⁹. Despite this only 4% of hernias UK are carried out laparoscopically and it is similar in Europe except in Germany where 30% of the hernia surgery is carried out laparoscopically.
However, these benefits are outweighed by several factors like its longer learning curve, higher cost, need for general anaesthesia. Today laparoscopic repair accounts for 5 to 15% of all hernia repairs in the developed world and a miniscule percentage in the developing world\textsuperscript{10}.

**WHAT ABOUT RURAL SURGEONS?**

It is very easy to conclude that laparoscopic surgery has no place in rural surgery considering the long learning curve, the high cost and the need for general anaesthesia. What would the rural surgeons do if the high cost and the need for general anaesthesia are negated?

We present the possibility of doing laparoscopic hernia repair using GILLS laparoscopic surgical technique. It is important to choose initially thin patients with small hernia. Surgeries are possible under low cost Spinal Anaesthesia. The dissection by carbon di oxide is a myth and it is fairly easy to dissect in the correct avascular plane.
The patient is placed supine after spinal anaesthesia. Two towel clips are used to hold the lower half of the Umbilicus and an incision is made through the lower half. It is widened to pass a finger comfortably and using this as the guide the Lift apparatus is placed and anterior abdominal wall is lifted under vision. After sufficient time has elapsed the patient is placed in a steep head down position. Shoulder braces are used to prevent the patient from slipping after positioning.

Unlike the conventional laparoscopic hernia surgery it is better to have the peritoneal incision much higher [3 to 4 cm] above the hernia and have the right hand instrument come directly into the opened space superficial to the peritoneum. An additional instrument could be passed below the camera at the umbilicus to hold the peritoneum down. Blunt and sharp dissection could be used to dissect the peritoneum. The plane of dissection is anterior to the fascia transversalis.
The inferior epigastric vessels should be kept anterior and should not fall back to maintain the correct plane of dissection. The lateral dissection would expose the psoas muscle and sometimes the lateral cutaneous nerve could be seen.

The hernia sac is then identified and circumferential dissection is carried out teasing the spermatic cord away from the sac. The dissection of the sac starts anteriorly as there is no important structure anteriorly. The sac is pulled inward towards the midline while dissecting. The sac is rotated anticlockwise during dissection of the cord structures away from the sac.
If the sac is large after it is dissected away from the cord structures the sac can be divided. The limit of dissection of the vas is till the area where it turns medially near the obliterated umbilical artery.

It is important to check that the hernia sac is completely dissected. The testes could be seen in the scrotum through the sac to confirm. The cremasteric fibres should be divided to free the sac.
While dissecting it is important to identify the triangle of doom that is bound by the vas, the testicular vessels and the peritoneal fold and the triangle of pain bound by ilio-pubic tract, testicular vessels and the peritoneal fold. These are important because the former contains the iliac vessels and the latter the nerves. Unnecessary dissections and injury would cause problems.

For fixing the mesh either the mesh could be first place and fixed either with suturing or tacks or first the 2 zero Prolene suture could be taken in the Cooper’s ligament and then to the mesh outside the body.

If taken from outside the second suture on the superolateral side could also be taken and then the mesh pushed through to it’s correct place easily. Few tacks or sutures could be taken if necessary. The peritoneum is then closed to complete the surgery.
It is good to note that the dissection with GILLS is similar to conventional laparoscopic surgery for hernia and a good video from which the anatomical pictures were taken is available in YouTube [thanks to Dr. Kriplani]

https://www.youtube.com/watch?v=Udt9biv_C00

Laparoscopic hernia repair is a difficult surgery. We did a few 10 years ago and gave up because it took a long time and anyway the standard surgery was extra - peritoneal and finished quickly.

However with the gas less laparoscopic surgery we stated doing it again and found it much easier than the regular laparoscopic surgery initially especially with suturing and dissecting as we can use the open surgical instruments. We were lucky that the first few patients were very thin and had a
narrow abdomen. We struggled with obese patients and large hernias and found it difficult to convert to regular laparoscopic surgery and ended up doing open surgeries. Hence it is important to choose the following types of patients

1. Thin patients
2. Patients with narrow abdomen [so that there is sufficient space below the lift]
3. Patients with small hernia

A team in China have shown that it is possible to TEP [Total Extraperitoneal] hernia repair too with GILLS 32. They managed to do this with single incision.

REFERENCES