The Kugel repair for groin hernias

Fouad Hachem, M.D.
900,000 hernia repairs/yr
65% utilize mesh : 80% lichtenstein
20% PHS
27% Tension repair (Bassini, McVay)
RR 10%
6% Laparoscopic
1% others
The anatomy of inguinal region is misunderstood by some surgeons of all levels of seniority

R. Condon

(Hernia, Second edition 1978)
Myopectineal orifice: “window of groin”

Henry Fruchaud

Boundaries: laterally Iliopsoas
Medially lateral rectus
Superiorly (IOM/TOM)
Inferiorly Cooper’s ligament

Triple triangle of groin: *No muscle coverage*
Inguinal Region
Dissection - Posterior [Internal] View

Regione inguinale
Vista posteriore
Traditional repairs

- Eduardo Bassini (1844-1924)
  - radical cure of inguinal hernia - 1887
- William Halsted (1852-1922)
  - Halsted I - 1889
  - Halsted II (Ferguson-Andrews) - 1893
- Earl Shouldice (1891-1965)
  - overlapping (imbricated) transversalis fascia - 1930
Traditional repairs

- Chester McVay (1911-1987)
- Pectineal ligament - 1948
Mesh Repairs

- F.C. Usher
  - “Marlex mesh: a new plastic mesh” – 1959
- J.Rives
  - “treatment of the inguinal hernia with Dacron” 1967
- R.E. Stoppa
  - “interposition without fixation of Dacron” – 1973
- Irving Lichtenstein
  - the tension-free hernioplasty-1989
Open mesh vs. non-mesh for repair of inguinal hernia

- Decreased RR between 50-75%
- Cochrane Database Syst Rev 2002;(4):CD002197
- 20 TRIALS
Laparoscopic techniques versus open techniques for inguinal hernia repair.
McCormack K, Scott NW, Go PM, Ross S, Grant AM; EU Hernia Trialists Collaboration.

“The use of mesh during laparoscopic hernia repair is associated with a relative reduction in the risk of hernia recurrence of around 30-50%. However, there is no apparent difference in recurrence between laparoscopic and open mesh methods of hernia repair. The data suggests less persisting pain and numbness following laparoscopic repair. Return to usual activities is faster. However, operation times are longer and there appears to be a higher risk of serious complication rate in respect of visceral (especially bladder) and vascular injuries.”

Meta-analysis of laparoscopic inguinal hernia trials favors open hernia repair with preperitoneal mesh prosthesis.

Voyles CR, Hamilton BJ, Johnson WD, Kano N.

“Although LHR was associated with an earlier return to work compared with conventional sutured OHR, more recent mesh OHRs provide equivalent outcomes but at lower costs and potentially less severe complications, supporting an open technique using preperitoneal mesh prostheses as the optimal hernia repair.”

More progress has been made in hernia surgery in last 15 yrs than has been made in the previous 1500 yrs.

There has been greater appreciation for the mechanical advantage of a posterior or preperitoneal hernia repair.
By applying the prosthesis to the same side of the abdominal wall As the higher pressure, that intra-abdominal pressure actually contributes to the integrity of the repair instead of being the constant enemy, as it is with anterior repair.
Principles of hernia surgery

- Tension free
- Preperitoneal placement of mesh
  - preperitoneal
  - submuscular
- Sutureless
- Protect femoral canal
- Minimally invasive
“Tension-free” - Why?

- 1. Recurrence
- 2. Pain
Sutureless-why?

- Simplified placement
- Perfect conformity
  - hydrostatic tissue forces
  - intraabdominal pressure
- Decreased pain
Femoral Hernia

- Incidence greater than 1%?
- Occult femoral hernias
- Diagnosis?
What is minimal invasion

- Minimal damage
- Minimal risk
- Should not be defined by instrumentation
Robert D. Kugel

Kugel Hernia Patch
Background of Kugel Patch

- 1992 Laparoscopic repair-first Kugel repair
- 1993 Evolving patch
- 1994 first placed Kugel Patch
- 1994 first public presentation at ACS
- 1996 First commercial patches available
- Double layer
- Outer apron
- Recoil Ring
- Tissue apposition holes
- V-shaped cuts
- Transverse slit
Fig. 3. Mesh patch: (a) inner and outer welds; (b) transverse slit; (c) outer apron; (d) tissue.
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<th>Description</th>
<th>Intended Use</th>
<th>Quantity</th>
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Incision site

- Midpoint between ASIS & PT
- 2/3 medial and 1/3 lateral to an imaginary line between these 2 points
- 3-4 cm incision
- Slightly superior to internal ring
Continued entry and Transversalis fascia exposure

- Open external oblique parallel to its fibers
- Muscle splitting incision in IOM
- Avoid ileoinguinal & ileohypogastric nerves in this tissue plane
Entry into preperitoneal space

- The transversalis fascia is opened vertically and the preperitoneal space is entered (about 2-3 cm superior to the internal ring).
- Digital and blunt dissection are utilized to free the peritoneum from the overlying transversalis fascia and preperitoneal fat.
- Identify epigastric vessels (anterior and medial).
Entry into preperitoneal spaces.
All three potential hernia defects can be easily palpated within the preperitoneal space.

Indirect sac should be reduced and carefully separated from underlying cord structures.
Special care should be taken to complete the dissection posterior to the point where the vas deferens deviates from the spermatic vessels. This will allow the inferior edge of the patch to lie back over the iliac vessels.
Create Pocket

- Dissection is continued, creating a pocket only slightly larger than the kugel Patch.
Direct – pseudosac should be completely separated from preperitoneal fat and peritoneum

Femoral-reduce sac
It is important to make sure that Cooper’s ligament is visible and the pocket is freed up well below this level.
Key landmarks

- Medial - behind the symphysis pubis
- Lateral - approximately 3 cm beyond the transversalis incision
- Inferior - must extend well below the level of the inguinal ligament
- Approximately 3/5 of patch should sit above the level of the inguinal ligament and the remaining 2/5 below level of the ligament
- Patch should conform to the peritoneum
Anchor Patch

- Transversalis fascia closed using an absorbable suture
- The anterior layer of the patch is picked up with one **SINGLE** Stitch
- Test repair
A Complete Repair

- It covers the direct space
- It covers the internal ring
- It covers Cooper’s ligament and the femoral canal
No specific restrictions

Patients are only limited only by their discomfort

Maximum discomfort one to two days

Return to “regular” activities in a few days to a week
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<th>Acute infections</th>
<th>Late infections (after one year-two patients)</th>
<th>Mesh removed</th>
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The Kugel repair is
I. Minimally invasive
II. Nonlaparoscopic
III. Preperitoneal
IV. Sutureless