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Lichtenstein Repair – is the gold standard losing its glitter?

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More than 25 years have passed since Lichtenstein reported his tension free mesh repair for inguinal hernia and today this operation dominates the market in the Western world. It is regularly described as the gold standard operation. It promises very low recurrence rates, often cited [1] as below 1%, with rapid post operative recovery and few complications whilst being simple to perform and well within the technical range of a general surgeon and even trainees in the early stages of their training. One might have expected that the disease of recurrent inguinal hernia would have become a rarity but sadly this is not the case.

For an operation to be classed as a "gold standard" it should pass at least four tests.

1. It should be based on sound scientific principles.
2. It should be supported by high quality randomized trials
3. It should be supported by large scale clinical audit demonstrating that it can really deliver high quality results in routine practice
4. There should be no better technique available

Is the Lichtenstein repair based on sound principles. It has certain inherent weaknesses. Firstly it involves entry and potential injury to the inguinal canal and its contents. The inguinal canal is a complex muscular structure and damage results in long term chronic discomfort particular on exercise. Its contents include the vas, vascular structures and nerves all of which are in danger of injury with ample clinical reports to show that the dangers of injury are real rather than theoretical. Reduction in sperm counts, testicular atrophy or infarction and neuralgic pains have been well described. A sound mesh hernia repair requires ample overlap of the muscular defect by mesh of at least 3 cms if not 5 cms in all directions. The Lichtenstein fails to deliver such overlap inferiorly and probably medially in most hands. In response to the realization of this weakness, the Lichtenstein clinic itself now recommends larger meshes than were originally described. The Lichtenstein repair is not tension free despite claims to the contrary. Sutures to hold the mesh in place must induce some tension but perhaps more important is the tension produced over time by collagenisation of the mesh with later "shrinkage" of the mesh-collagen matrix. Finally, in modern surgery, the advantages of minimal access techniques have been amply demonstrated and any surgeon must feel obliged to justify why a maximally invasive operation is being undertaken when an alternative minimally invasive technique exists. The Lichtenstein repair therefore has basic design flaws.

Looking to the evidence from RCTs, a consortium of European hernia specialists published [2] a meta-analysis of 58 trials comparing mesh and none mesh repairs for a range of hernia types. They included 16 trials for inguinal hernia 8 of which compared Lichtenstein repair to the Shouldice operation and 8 to a mix of alternative suture techniques. In their analysis the p value comparing mesh with suture for recurrence after inguinal repair was less than 0.00001. However, the follow up interval was less than 2 months in 5 of the studies and not reported at all in two others. In addition, two of their studies had not been published leaving just 7 published studies with follow up of more than 2 months. Of these, 3 showed a statistical benefit to mesh repair and 4 showed no difference. Hence,

the whole weight of the argument in favour of mesh comes from three studies. The first from Sweden compared results for surgeons in training and demonstrated that the Shouldice repair was too technically demanding for training surgeons. The second from Denmark used Cooper´s ligament repair for comparison and admited that there was a 30% recurrence rate at two years for this repair. Clearly this study demonstates poor performance of Cooper´s ligament repair rather than an advantage of mesh. Finally from the Netherlands is a trial which compared Lichtenstein to sutured repair but unfortunately failed to document the exact nature of the sutured repair simply stating that this was left to the surgeon to decide. It is difficult to assess this study when we do not know what sutured repair was performed. Overall we are left with the conclusion that there are no adequate, well designed trials of mesh v suture repair with sufficiently long follow up. Since publication of this metanalysis there has been a large trial [3] of Lichtenstein v Moloney darn with a two year follow up and no significant difference recorded in any outome.

Schumpelick, in his excellent review [4] of the current status of mesh repair for hernia, noted that there was little evidence of a benefit for mesh in large scale epidemiological data ie audits. For incisional hernia, Flum [5] reported that mesh merely delays rather than prevents recurrence and the delay is in the order of 18 months. No data exists for long term results after inguinal hernia surgery but most publications from Europe and the USA would suggest that 10% of all inguinal hernias presenting to surgeons are recurrent and that this figure is not falling significantly. The Danish hernia register data does suggest a long term benefit for mesh but this will include Cooper´s ligament repair in the sutured group. Our own follow up of patients [6] operated over 10 years ago shows no benefit to the mesh group in terms of recurrence and explains why the incidence of recurrent hernia has not fallen in Scotland despite almost 100% use of mesh repair since 1995. In summary, long term audits have not shown that widespread use of the Lichtenstein operation has resulted in a significant fall in recurrent inguinal hernia.

Finally, is there anything better, There are over 50 RCTs of laparoscopic v open surgery and numerous metanalyses exist. NICE [7] in the UK is an independent group of scientists, appointed by government to assess new therapies. Their analysis of laparoscopic inguinal hernia surgery concludes that statistically significant benefits include less post operative pain, more rapid return to normal activity , less wound complications (bleeding, seroma and infection) and less chronic groin pain. They also conclude that the laparoscopic technique is cost effective. The TEP repair does not enter the inguinal canal with a much reduced risk of structural injury. Adequate mesh overlap is possible in all direction. As mesh fixation is necessary, tension is reduced to a minimum and of course it employs minimally invasive surgical techniques.

The Lichtenstein repair has inherent weaknesses in design, is not supported by high quality RCTs, has not delivered low recurrence rates in large scale audit reports and has now been overtaken by laparoscopic surgery. It is time that we stop referring to it as the "gold standard repair" as it clearly is no longer deserving of this accolade.

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