INTRODUCTION

The term ‘HERNIA’ derived from the Greek word meaning an offshoot or a bulge.

In Latin the word ‘HERNIA’ means to tear or to rupture.[1]

A hernia is an abnormal protrusion of a peritoneal-lined sac through the musculoaponeurotic covering of the abdomen.[2]

Abdominal hernias include groin hernia (70%), umbilical hernia (15%), epigastric hernia (7%) and incisional hernia (9%). Most abdominal hernia arises in the groin (from the Latin word *inguen*, so named *Inguinal*) because it is the transition zone between the abdomen and thigh. Inguinal canal is a potential weak opening in the lower abdominal wall, which allows the passage of blood vessels, lymphatic, vas deference and nerves to enter the scrotum. Approximately 96% of all the groin hernias are inguinal and remaining 4% being femoral. [3]

Hernia Surgeries are basically of three types;

- Herniotomy – Excision of hernia sac.
- Herniorrhaphy – Repair of hernia defect with use of anatomical tissue.
- Hernioplasty - Repair of the hernia defect with reinforcement of mesh.

All these can be done either through open or laparoscopic surgery.

The first half of the 20th century hernia surgery based on good anatomical knowledge of inguinal region and dominated by pure tissue repair based on Bassini-type inguinal hernia repairs and their variants, which included the Marcy, McVay, Halstead, Andrews, Ferguson, and Shouldice repairs. Since the introduction of the Bassini method in 1887, more than 70 types of pure tissue repair had been reported in the surgical literature.

The most commonly performed tissue repairs are those of Bassini, Shouldice, and to a lesser extent McVay and have mean recurrence rate of 7.3%, 1.1% and 5.2% respectively.[4]

Cunningham J et al. has studied the chronic pain for 2 yrs in the post operative period for Bassini, McVay and Shouldice. At 1 year 62.9% patient had some inguinal pain and 11.9% had moderate to severe pain; at 2 years the result was 53.6% and 10.6% respectively.[5]

A review of literature published on the recurrence and re-recurrence of tissue repair were as follows: [6]

- Bassini: recurrence, 2.9% to 25% and re-recurrence, 6.5% to 13.4%
- McVay: recurrence, 1.5 to 15.7% and re-recurrence, 2.4% to 5.5%
- Shouldice: recurrence, 0.2 to 2.7% and re-recurrence, 2.9% to 6.36%
- Nyhus: recurrence, 3.2% to 21% and re-recurrence, 9.5% to 27.0%.
An unacceptable recurrence rate and prolonged postoperative pain after tissue repair along with better understanding of the metabolic origin of inguinal hernias led to the concept and acceptance of tension-free hernioplasty with mesh.[7]

Billroth (1829-94) stated a dream, "If we could artificially produce tissues of the density and toughness of fascia and tendon, the secret of the radical cure of hernia would be discovered."[8]

In second half of the 20th century, D.E. Acquaviva (1944, France) presented the first use of a nylon synthetic mesh (polypropylene was not available until 1957) in a manner that eliminated herna and tension while leaving a defect intact.[9] Francis Usher focused on development of prosthesis and finally introduced a new polymer 'polypropylene' (Marlex 50).[10] After that many surgeons had used polyester, polypropylene, and e-PTFE meshes to repair the posterior wall of inguinal canal.

In 1914, Sir Francis Darwin (the son of Charles Darwin) had made the statement that

"In science, the credit goes to the man who convinces the world, not to the man to whom the idea first occurs"[9]

In 1989, Lichtenstein introduced the current concept of the “tension free” polypropylene mesh repair as an office procedure under local anesthesia, into everyday, common place and because of that onlay herna surgery with mesh is known as “Lichtenstein’s tension free hernioplasty”. He also pioneered the idea that hernia surgery is special, that it must be performed by an experienced surgeon, was a major shift towards use of prosthesis.[10]

- That has brought changes in surgeon’s attitudes, and the result of four general concepts affected the way surgeons practice their craft. These include: (a) the widespread acceptance of the "tension-free" principle; (b) routine use of prosthetic materials; (c) the realization that the preperitoneal space used for herna repair; and (d) therapeutic laparoscopy.

Recurrence and re-recurrence rate for hernioplasty with mesh reported as follows:[6]

Lichtenstein: recurrence, 0% to 1.7% and re-recurrence, 0% to 3.4%
Rives: recurrence, 0% to 9.9% and re-recurrence, 0% to 1.7%
Stoppa: recurrence, 0% to 7% and re-recurrence, 0% to 8%
Nyhus buttress: recurrence, 0% to 1 7% and re-recurrence, 0% to 1.7%.
Plug repairs: recurrence, 0% to 1.6% and re-recurrence, 0.5% to 1.6%.

These had shown that the recurrence was well achieved with the use of mesh, but there were variable data for the post operative pain and its etiology.
National Library Medicine MeSH term has defined recurrence as - [11]  
"the return of a sign, symptom, or disease after a remission".

National Library Medicine MeSH term has defined pain as – [11]  
"An unpleasant sensation induced by noxious stimuli which are detected by nerve endings of nociceptive neurons" and chronic pain as “Aching sensation that persists for more than a few months.

It may or may not be associated with trauma or disease, and may persist after the initial injury has healed. Its localization, character, and timing are more vague than with acute pain".[11]

The International Association for the Study of Pain (IASP) defines pain as -  
"an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage". This definition declares that pain, as well as having a physiological basis has a very real psychological or subjective component.[12]

The IASP provides one of the most referenced definitions of chronic pain.

Chronic pain is that which persists beyond the normal time frame for healing, usually taken to be 3 months. The IASP considers a further characteristic related to the "appropriateness" of the disorder.[12]

Transition between acute and chronic pain has been defined by most authors in terms of time. The two most commonly used chronological markers to denote chronic pain have been 3 and 6 months since the initiation of pain, however these distinctions are arbitrary. Various studies had reported wide range of chronic pain incidences.

- Bay-Nielsen et al (2001, Denmark) using cross sectional cohort study design, studied pain and functional impairment after 1 and 2 years ofinguinal herniorrhaphy with a nationwide questionnaire, from Danish Hernia Database and found 28.7% patients had chronic pain. 11.0% patients had pain interfering with work or leisure activity, of which 3% had moderate or severe pain while at rest and 8% had with physical activity. Older patients had a lower incidence of pain.[13]

- Aasvang and Kehlet (2005, Denmark) reviewed the literature and concluded risk of chronic pain is about 12%, there is less chronic pain after a mesh repair compared with non-mesh, younger patients have more complaints than older, employed had more than retired, and nerve damage may be the most important factor for chronic pain.[14]
• Alfieri et al. (2006, Italy) had done a multicentric (11 Italian institutions) prospective study and found that groin pain was 9.7% at the 6-month with mild intensity in 7.9% and moderate to severe in 2.1%. At 1 year follow up 4.1% had pain; intensity was mild in 3.6% and moderate to severe in 0.5%. They strongly stress the importance of identifying and preserving all 3 nerves of the inguinal canal, during hemioplasty surgery, to minimize the incidence of chronic postoperative groin pain.[15]

• Poobalan and Bruce et al. (2003, UK) had reviewed all studies of postoperative pain after inguinal hernia repair with a minimum follow-up period of 3 months and found that chronic pain after inguinal hernia repair was as high as 54%, much more than previously reported.[16]

• Bhattacharjee et al. (2009) had studied groin pain 5-7 years after a 'modified' plug and patch inguinal hernioplasty with only two patient friendly terms; discomfort and pain, and found 6% and 5% patients respectively. They concluded that significant restricting groin symptoms were uncommon and had a negligible impact on their daily lives.[17]

• Franneby et al. (2006, Sweden) had studied the patients 2 to 3 years after hernia surgery from the Swedish Hernia Register by postal questionnaire to estimate the prevalence of residual pain. They found that 31% reported pain to some extent and 6% had pain interfered with daily activities.[18]

• Jaiswal et al. (2009, India) had done prospective study and found that only 0.78% patients had chronic groin pain with mean follow-up period of 14 months (range – 6 to 24 months) and concluded that it is considerably less than what is generally reported and also less disabling.[19]

Various studies have found female gender, young patients, recurrent hernia repair, preoperative pain, day case surgery, delayed onset of symptoms and high pain scores in the first week after surgery were identified to be risk factors for the development of chronic pain.[14, 16]

Inguinal nerve manipulation and injury lead chronic pain was suggested by many [14] but Bartlet et al had concluded that it has no effect.[20]

There are many limitations for proper evaluation of postoperative pain as -

• There were many other studies for chronic pain with variable results and variable etiology for chronic pain.
• There were many study design for addressing the problem.
• Definition of chronic pain was not explicit in the majority of the reviewed studies.
• Accurate evaluation of the frequency of chronic pain will require standardization of 
definition and methods of assessment.
• Prospective studies are required to define the role of identified risk factors.
• There is scope of research as there was much variability and lack of much data 
published form Indian subcontinent.

I intend to address these areas with specific objectives.