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**ORIGINAL ARTICLE**

**Inguinal Hernia: The 'C S' way...!**

Clement S Rajan<sup>1</sup> and Kaushik Bhattacharya<sup>2,\*</sup>

<sup>1</sup>*Emeritus Consultant Surgeon, Department of Surgery, St Martha's Hospital, Bengaluru - 560001, Karnataka, India*

<sup>2</sup>*Associate Professor, Department of Surgery, Mata Gujri Memorial Medical College and LSK Hospital, Kishanganj - 855107, Bihar, India*

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**Abstract**

The inguinal hernia is a common clinical condition in a General Surgeon's Practice. All aspects of current inguinal hernia practice, clinical, operative and common complications, have been described using the letters 'C and S', to give a novel way of reading again, and recollecting, the essentials of the inguinal hernia.

**Keywords:** Inguinal hernia, clinical aspects, operative management, complications, C and S

\*Corresponding Author: Kaushik Bhattacharya  
Email: kbhattacharya10@yahoo.com

## Introduction

A simplified mnemonic has been developed for the postgraduate students and surgical trainees to remember the science of inguinal hernia in the ward. The idea of developing this mnemonic is to make the surgical trainees not miss any steps during the surgery and in the postoperative period.

**Canal Structure** anatomy (from the front) vital for open surgery.

**Concealed Sequence** anatomy (from inside / posterior aspect) important for Minimally invasive surgery (Laparoscopy).

**Closing Shutter** mechanism of local functional muscular physiology must be understood.

**Clinical State** of Inguinal Hernia, the findings would be either

1. Coming Straight through posterior wall (Direct), or
2. Circle Side entry into inguinal canal (Indirect)

**Comparative Size** – complete (into scrotum), or incomplete (buboncoele)

**Content Status** – reducible / irreducible / obstructed / strangulated

**Coats' Strength** - local muscle tone to be noted

**Causes (of) Susceptibility** to inguinal hernia to be looked for

**Consider Sonics** (Ultrasound) to confirm diagnosis (and for Insurance issues)

**Classification Schedules**

1. (Of) **Champion Seniors**: Gilbert / Nyhus / Zollinger / Bendavid (TSD) – all outdated
2. **Contemporary Schemes**: Aachen / European Hernia Society – most preferred today

**Choice of Surgical options**

1. **Circumspect Standby** option of 'watchful waiting', no surgery for now, but kept on follow up.
2. **Covering Strap**, or the external truss, for the symptomatic patient, but unfit for surgery.
3. **Cut & Suture** (open surgical option).

**Cul de Sac Ligation** (herniotomy) suffices in infants, and the young up to 18 years

**Containing Stitches** only (tissue repair, or herniorrhaphy)

**Constructed Support** (mesh repair or hernioplasty)

4. **Closed Solution** (Minimally Invasive Surgery, MIS) –

Ideal for

Coming Second time (recurrence)

Coupled Set (bilateral)

Methods available

**Coelomic Sighting** (trans peritoneal route, or the TAPP)

Completely

Suprapubic (extra peritoneal route, or the TEP / eTEP)

**Consent Sanction** - Informed Consent explaining need for surgery, and of all options available.

**Chronic States** of pain persisting in some patients post operatively (inguinodynia and /or orchalgia) besides the chance of recurrence of the hernia, to be part of the informed consent

**Core Statuettes** - Pre Operative general principles are -

Choice Specific surgical approach to each case

Clean Surgery – hernias are best done as first case in OT list of the day

Confined (Local) or Systemic anaesthesia (Regional / General) may be used.

A. Cut & Suture (open surgery)

Common Steps - Initial

Crease Start – transverse inguinal crease incision, exposing external oblique

Canal Slit open- by cutting external oblique muscle in line of fibres

Conserve Sensation- nerves to be safeguarded

Cord Search for sac – antero-lateral for indirect, and postero-medial for direct

Call (back) Sac - indirect sac, herniotomy; direct sac, invaginate

Cremaster Slicing – debulking the hypertrophic cremaster muscle in canal

Common Steps – After the tissue / mesh repair of posterior wall

Close Subcutaneous tissues  
Cuticular Skin closure, either intradermal suture, staples or Steri Strips

a) Containing Stitches repair -

(herniorrhaphy)

Classical Shouldice is the Gold standard operation

Create Sleeves - divide posterior wall completely, create Transversalis fascia flaps

Close (in) Six layers, starting with double breast of the Transversalis fascia

Circumvent Stress, with NO tension on suture lines

Cohesive, Strong layered repair obtained

Cut-out Strip of External Oblique Muscle as a ‘live patch’ repair, as the Desarda technique is an alternative form of tissue repair

b) Constructed Support (with a prosthetic mesh) – (hernioplasty)

Create Space beneath the external oblique muscle

Comfortable Size of mesh used, minimum adequate is 7.6 x 15 cm

Compact Sutures, of smaller sizes preferred (2/0 or 3/0 non-absorbable, loose knots)

Commencing Stitch of mesh fixation, 2.5cm medial to pubic tubercle, into rectus sheath

Configure Shield (mesh), with ‘fish tail’ across emerging cord at deep ring

Crumpled, (not) Stretched look on completion, no tension in placement

**B. Closed Solution (MIS)**

**Common Steps**

- Chief Surgeon at head end of table
- Cuboid Screen (monitor) at foot end of table
- Coming (down) Shoulders – the Trendelenburg position
- Care (at) Specific sites - Triangles of Doom & Pain

**a). Completely Suprapubic (TEP)**

- Contrive Spherical area behind pubes in extra peritoneal space
- Cephalad Striping of peritoneum and sac to expose all 3 potential defect spots
- Copious Size of mesh to cover all defects
- Clip Stick mesh with

tackers

**b). Coelomic Sighting (TAPP)**

- Central Spot (umbilicus) for pneumoperitoneum, enter abdomen

Cut Shining peritoneum over groin area

Cephalad Striping of peritoneum and sac to expose all 3 potential defect spots

Copious Size of mesh to cover all defects

Clip Stick mesh with tackers

Close Surface membrane (peritoneum) over mesh

c) Capacious Spread-out in the pre-peritoneal plane, (eTEP\* and eTEP-RS\*\*) is latest

approach being advocated by Contemporary Surgeons adept at Closed Solutions (MIS).

[\*eTEP = Extended totally extraperitoneal, & \*\*eTEP-RS = Extended Totally Extraperitoneal Rives-Stoppa]

Core Statuettes – the post-operative general principles are

Check and Survey for early SSO\* – like Seroma, & SSIs (Surgical Site Infections)

[\* SSO - Surgical site Occurrences]

Convalescence Short – encourage early return to work

Continued Surveillance for recurrence

Cribriform Sheets (Meshes / prosthesis used)

Are Composed of Strands of woven non-absorbables, and are Cheap and Strong

Less often Composite Synthetics are used to reduce visceral adhesions.

Constraining Staples (tackers) offer easy mesh fixation at MIS

Clinging Stickies (glue) have also been tried.

Today we have the Console Surgeon with his Complaint Slave (Robotic Surgery) as a MIS Option!

Complications Seen and their Commended Solutions are

(for both, the open and the minimally invasive surgery options)

Common Seroma in wound / groin,  
best left alone to get absorbed

Congested Scrotum – transient  
pain and/or swelling, use scrotal  
support

Cut's Sting - immediate post op  
pain, oral analgesics suffice

Curtain Sepsis – mesh Infection /  
rejection, both are dreaded,  
with high morbidity, will  
ultimately need mesh  
explant

Continued Soreness –  
inguinodynia, delaying  
recovery, affecting Quality  
of Life scores, will need  
counselling and  
physiotherapy. Can try  
local Cortico-Steroid  
injections at specific pain  
trigger points in that groin.  
May need to Consider  
Surgery again to explant  
mesh.

Circulation Subtraction to gonad –  
Ischemic orchitis,  
(infarction leading to  
atrophy) with orchalgia, is  
also unpleasant, and may  
need surgical exploration /  
orchidectomy

Coital Sensitivity – Dysejaculatory  
syndromes in a few, settle  
with counselling and time

Crying Symphysis denotes pain d/o  
osteitis pubis, also needs  
counselling, and analgesics

Comes Second time, the  
unwelcome recurrence...!

- Cut & Suture (Anterior)  
repair recurrence – repair  
by Closed Solution (MIS)

approach

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### **Author's Contribution**

**KB:** Literature review, data analysis, and critical revision of the manuscript for important intellectual content, Conceptualisation, study design, data acquisition, data interpretation; **CSR:** Conceptualisation, study design, data acquisition, data interpretation, and manuscript drafting, study design, data acquisition, data interpretation, and manuscript drafting; **KB CSR:** Supervision, final approval of the manuscript, and accountability for all aspects of the work.

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