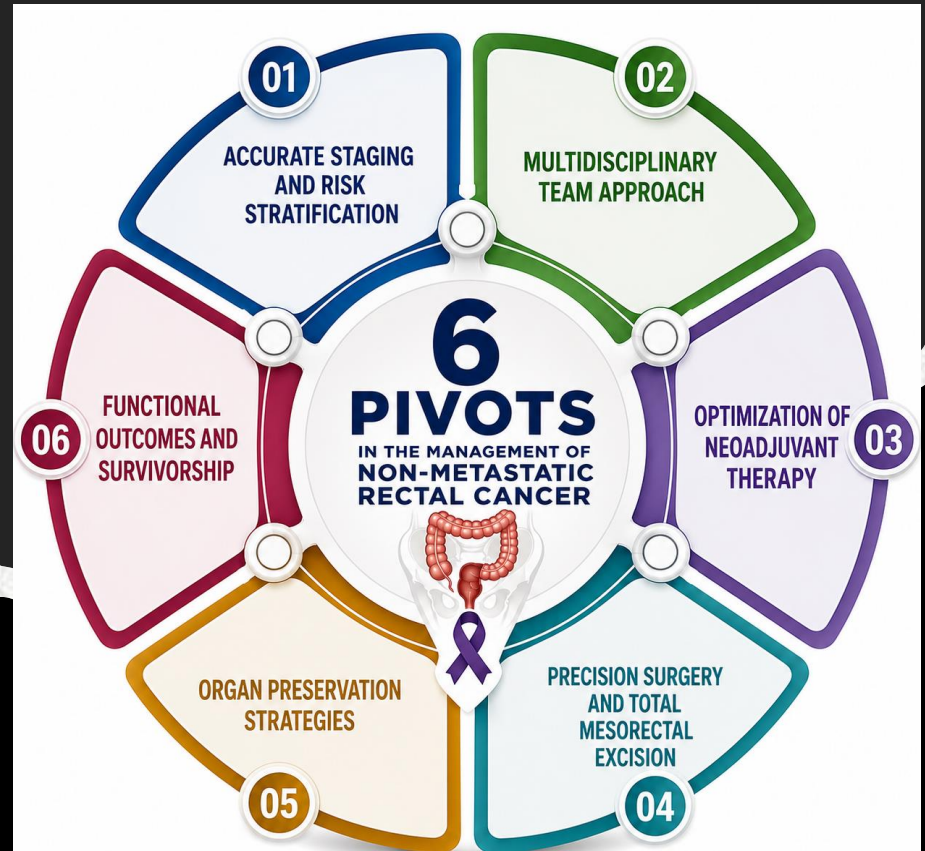


Management of Non-Metastatic Rectal Cancer

Ahmed Mostafa Mahmoud, MD
Professor of surgical oncology
National Cancer Institute
Cairo University



Accurate Staging and risk stratification

High risk for systemic metastases

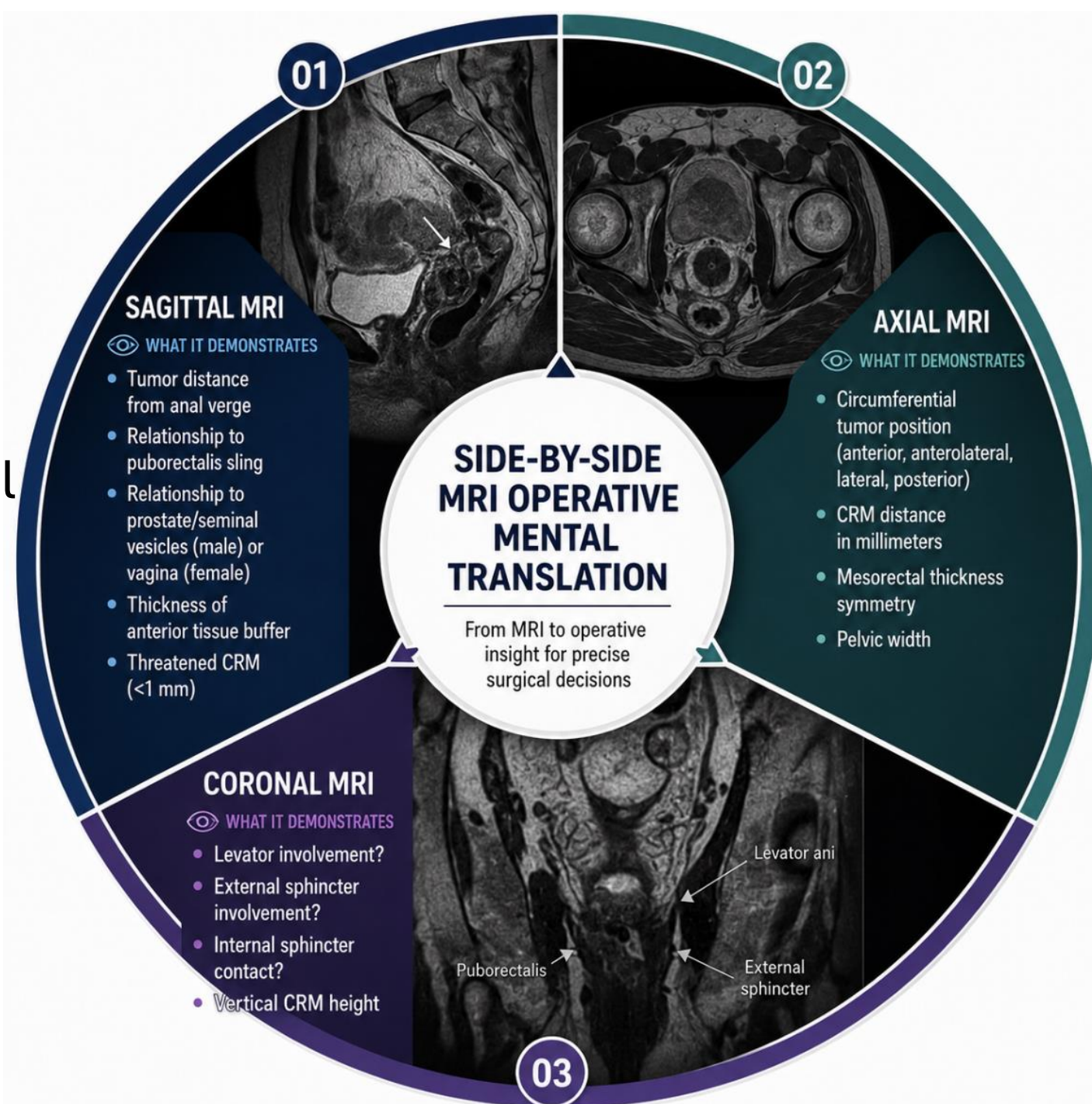
High risk for Local Recurrence

Mental Translation

Sagittal MRI → Longitudinal operative planning

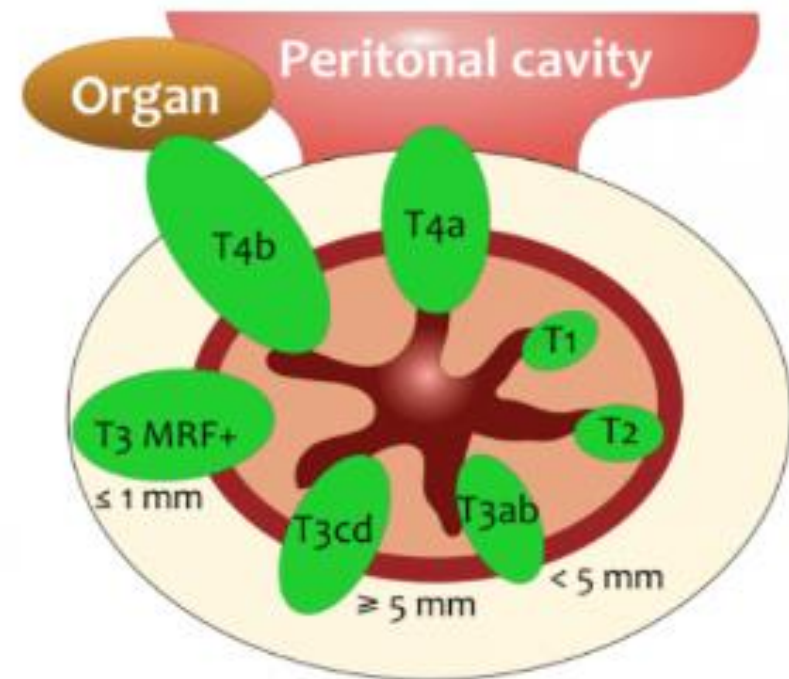
Axial MRI → Radial/circumferential operative geometry

Coronal MRI → Pelvic floor and sphincter strategy



Risk stratification dictates the Management

- Risk stratification is no longer adequately represented by **cTNM**
- The **Practical framework** is MRI-defined risk of local failure + risk of systemic failure + tumor height/anatomical difficulty + (molecular biology).
- **High-resolution pelvic MRI/ Rectal Protocol** is therefore central to treatment selection.



SYSTEMIC RISK vs LOCAL RISK

Key Determinants of Oncologic Strategy in Rectal Cancer Surgery

2 SYSTEMIC RISK

Determines risk of distant metastasis
and need for systemic therapy



EMVI

Extramural Vascular Invasion



TUMOR DEPOSITS

Presence of tumor deposits
in mesorectum



T / N BURDEN

TNM stage
(T stage, N stage, number
of positive nodes)

1 LOCAL RISK

Determines risk of local recurrence
and technical difficulty of surgery



MRF / CRM

Distance to mesorectal fascia /
circumferential resection margin



T3 DEPTH

Extramural depth beyond
muscularis propria



TUMOR HEIGHT

Distance from anal verge



SPHINCTER / LEVATOR ANATOMY

Sphincter involvement and
levator ani involvement

Optimization of Neoadjuvant Treatment and MDT approach

Evolution of cancer care/ New type of surgeon

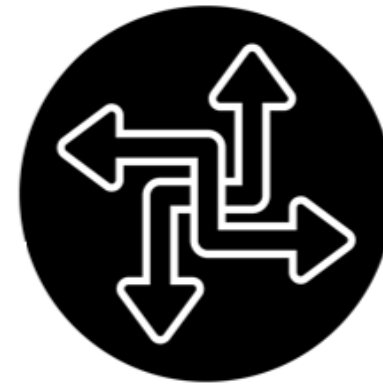
Four pathways for rectal cancer patients

1-TNT, Induction pathway Chemo-Radiotherapy

2-TNT, Consolidation pathway Radio-Chemotherapy

3- Watch and Wait (**NO surgery**)

4- **Direct to surgery**



Induction versus Consolidation debate

No difference in survival outcomes in large RCTs

Only difference is likelihood of a complete response - candidacy for TME avoidance

Consolidation chemotherapy - worse GI and genitourinary functional outcomes after TME

If patient has imaging indicators for neoadjuvant therapy and destined for surgery - consider induction chemotherapy first

If patient has **tumour specific** factors suggestive of high systemic disease risk – consider induction therapy first

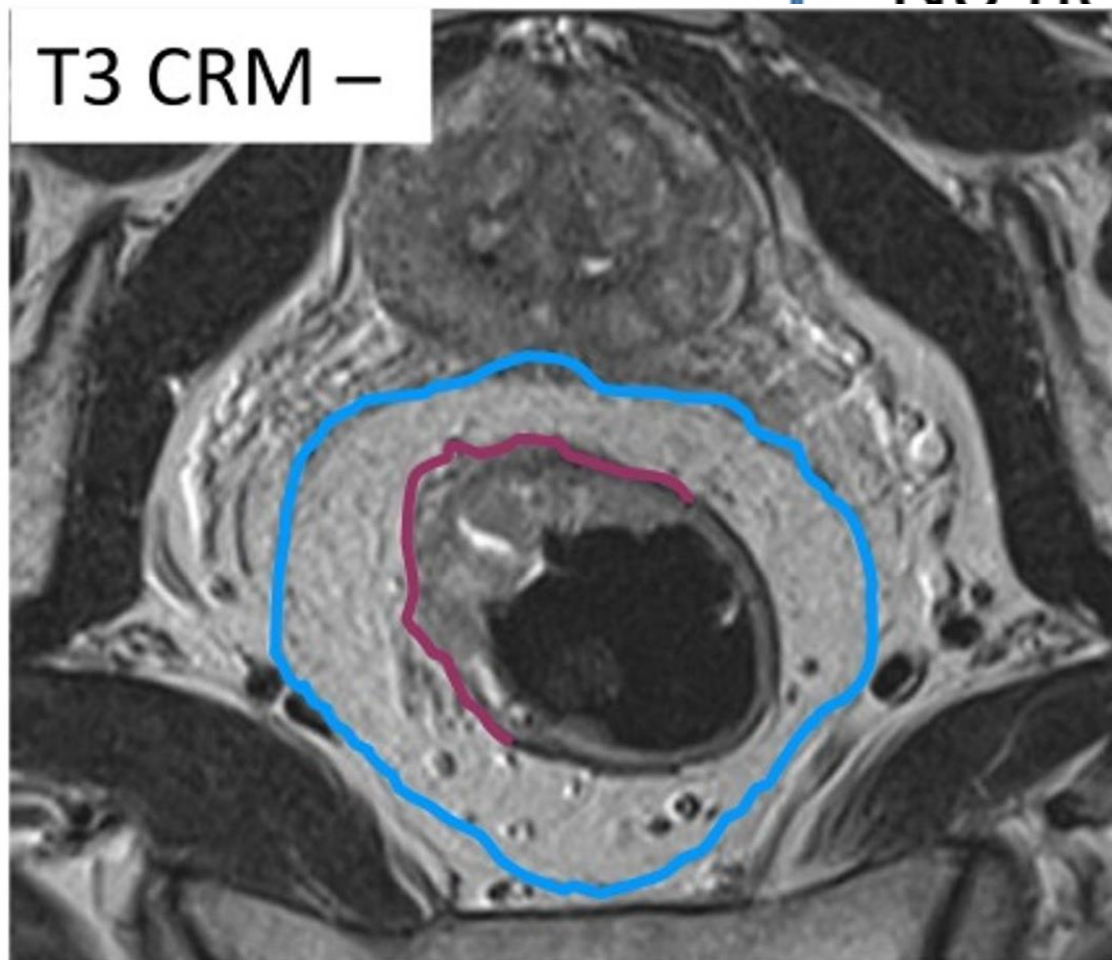
If nonoperative management is planned and no significant concerns for systemic disease risk - consolidation chemotherapy



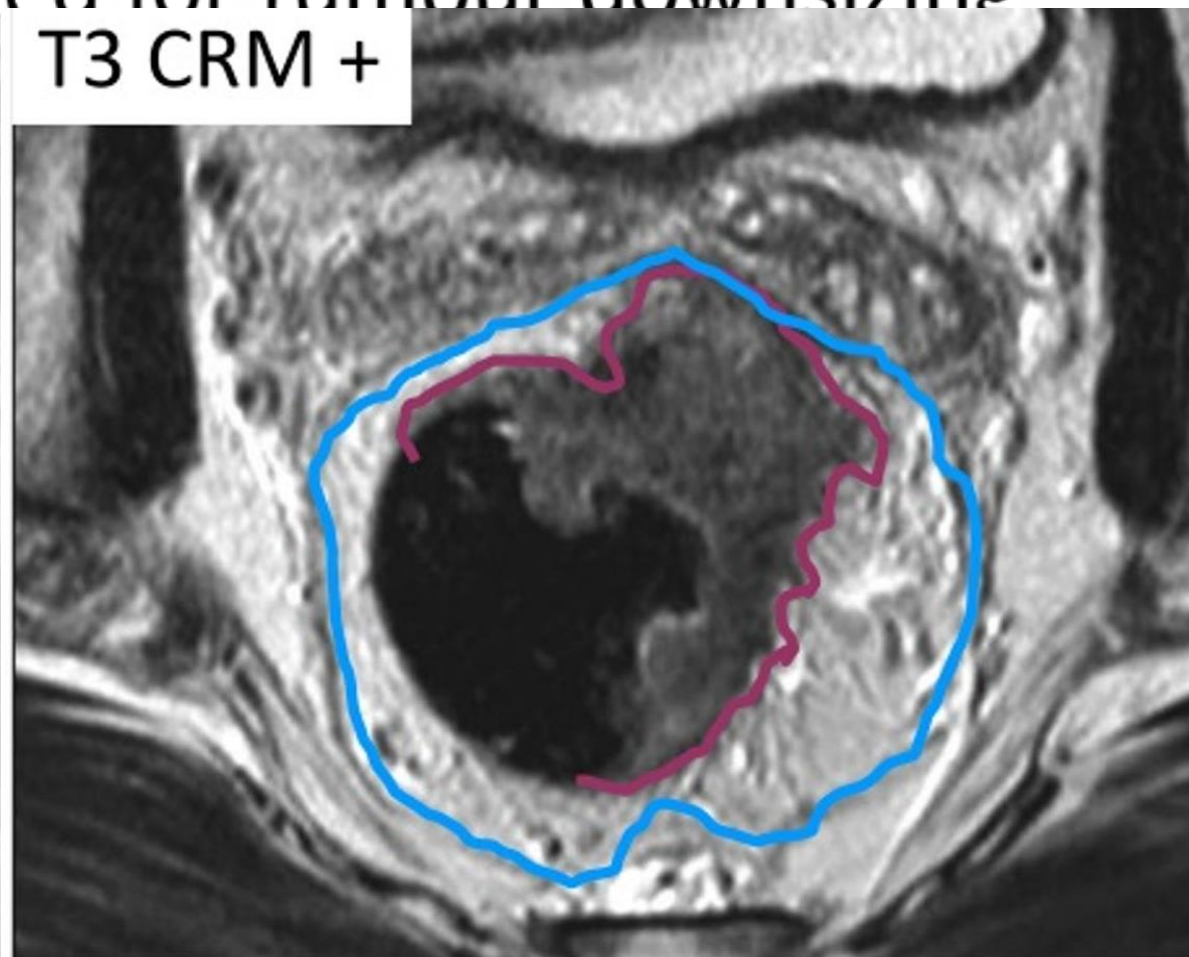
Direct to Surgery Pathway

No need for tumour downsizing

T3 CRM –

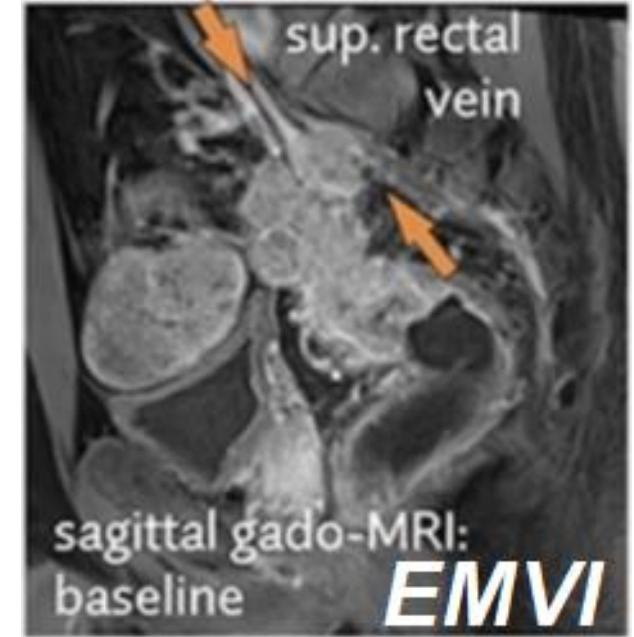
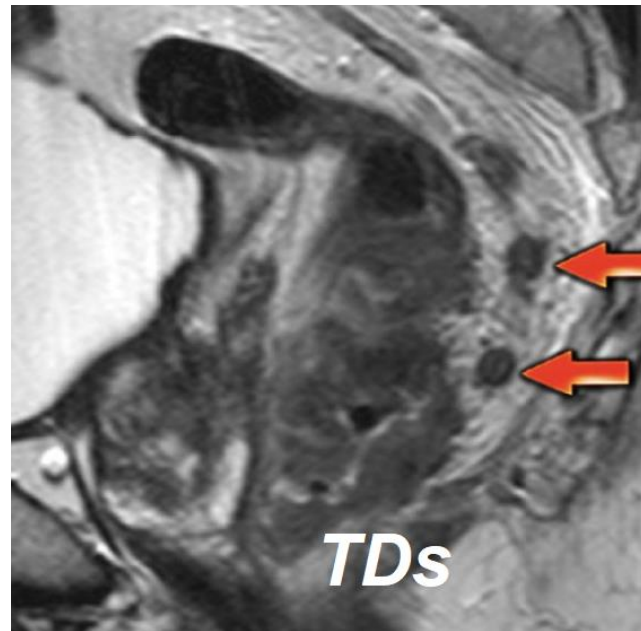


T3 CRM +



500/100/1/

The **High-Risk Group**, with the most chance of benefiting from preoperative treatment.





Rectal Cancer
Upfront TME

Preoperative High-resolution Magnetic Resonance Imaging Can Identify Good Prognosis Stage I, II, and III Rectal Cancer Best Managed by **Surgery Alone** A Prospective, Multicenter, European Study

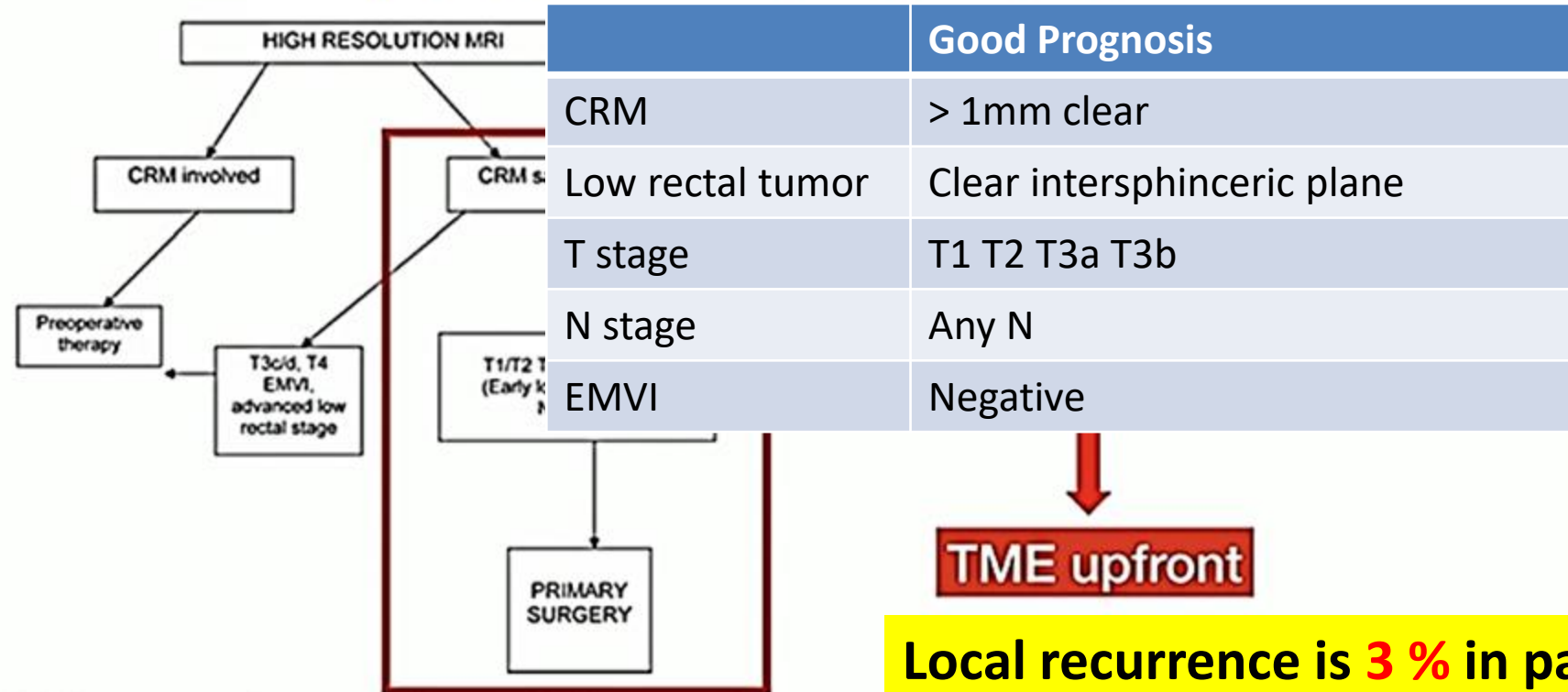


FIGURE 2. Treatment plans according to MRI prognosis.

Local recurrence is **3 %** in patients with good prognosis

Assessment of the 2020 NICE criteria for preoperative radiotherapy in patients with rectal cancer treated by surgery alone in comparison with proven MRI prognostic factors: a retrospective cohort study *Lancet Oncol 2022*



	Crude local recurrence		Crude distant recurrence	
	Patients (%)	p value	Patients (%)	p value
T stage on MRI				
T1-T2 on MRI (n=167)	7 (4%)	0.15	48 (23%)	0.0016
T3-T4 on MRI (n=211)	15 (7%)	..	18 (11%)	..
Lymph node metastases on MRI				
Negative (n=252)	12 (5%)	0.14	40 (16%)	0.16
Positive (n=126)	10 (8%)	..	26 (21%)	..
EMVI status on MRI				
Negative (n=288)	15 (5%)	0.14	32 (11%)	<0.0001
Positive (n=90)	7 (8%)	..	34 (39%)	..
Tumour deposits on MRI				
Negative (n=300)	17 (6%)	0.44	39 (13%)	<0.0001
Positive (n=78)	5 (7%)	..	27 (36%)	..
CRM status on MRI				
Safe (n=354)	19 (5%)	0.10	58 (17%)	0.027
Threatened (n=24)	3 (13%)	..	8 (33%)	..

EMVI=extramural venous invasion. CRM=circumferential resection margin.

Table 3: MRI prognostic factors and association with crude local and distant recurrence

Overuse of radiotherapy could occur with this unselective approach of NICE criteria.
6% LR rate with good technical surgery without chemo irradiation.

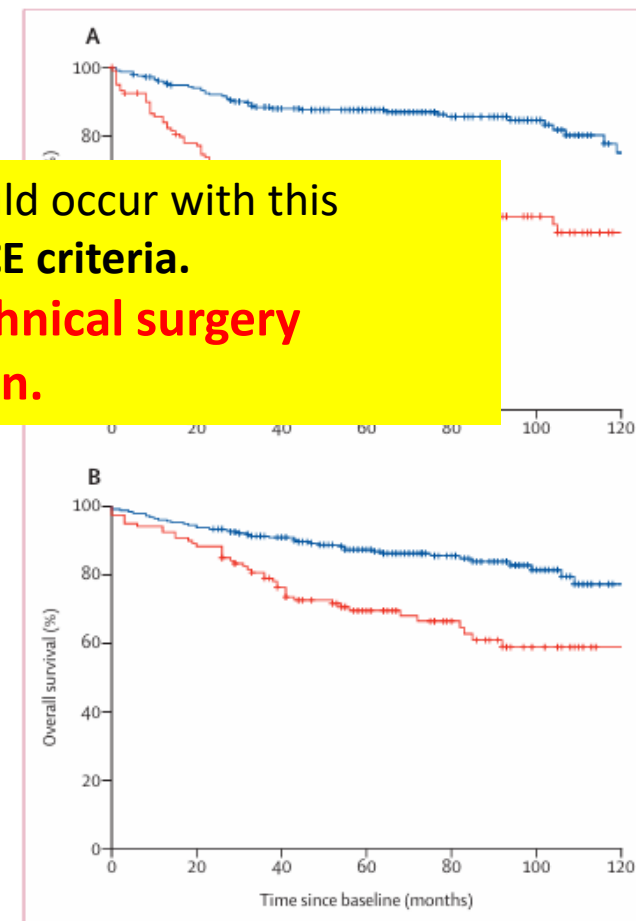


Figure 2: Disease-free survival (A) and overall survival (B) according to MRI risk assessment
Crosses denoted censored patients.

Four pathways for rectal cancer patient



01

Assessment of
high risk for
systemic
disease

Induction TNT

02

Decision on
candidacy of
Organ
Preservation

Consolidation TNT

03

Decision on
high risk of
locoregional
recurrence
Directed to surgery

Induction TNT
distend to surgery

04

Option of direct
to surgery

Early and high

ORGAN PRESERVATION STRATEGIES



Organ preservation
No Surgery Decision

Origin of Organ Preservation

Operative Versus Nonoperative Treatment for Stage 0
Distal Rectal Cancer Following Chemoradiation Therapy
Long-term Results

Angelina Haber-Gross, MD,* Rodrigo Ochoa-Perez, MD,* Wladimir Nishim, MD,*
Jorge Subbaga, MD,* Ulisses Roberto Jr, MD,* Alvaro Henrique Silva e Sousa Jr, MD,*
Fabio Guilherme Campos, MD,* David Roberto Rios, MD,* and Joao Vinicio Rodrigues, MD*
(Ann Surg 2004)

Wait-and-See Policy for Clinical Complete Responders After
Chemoradiation for Rectal Cancer

Monique Maat, Regine G.H. Beets-Tan, Doenja M.J. Lambregts, Guido Lammerting, Patty J. Nelenans,
Sanne M.E. Engelen, Ronald M. van Dam, Rob L.H. Jansen, Meindert Sosef, Jeroen W.A. Leijten,
Karel W.E. Hulshof, Jeroen Baaijen, and Geert van Lier, Beets

J Clin Oncol 2011; 29: 4633-40.

1

Opportunistic Approach

Watch and Wait

2

Intentional Approach



265 T2-T4 distal rectal cancers



192 T2-T4 distal rectal cancers



Candidacy for Organ Preservation



Within Digital reach



No concerns on
surveillance compliance



MDT agreement

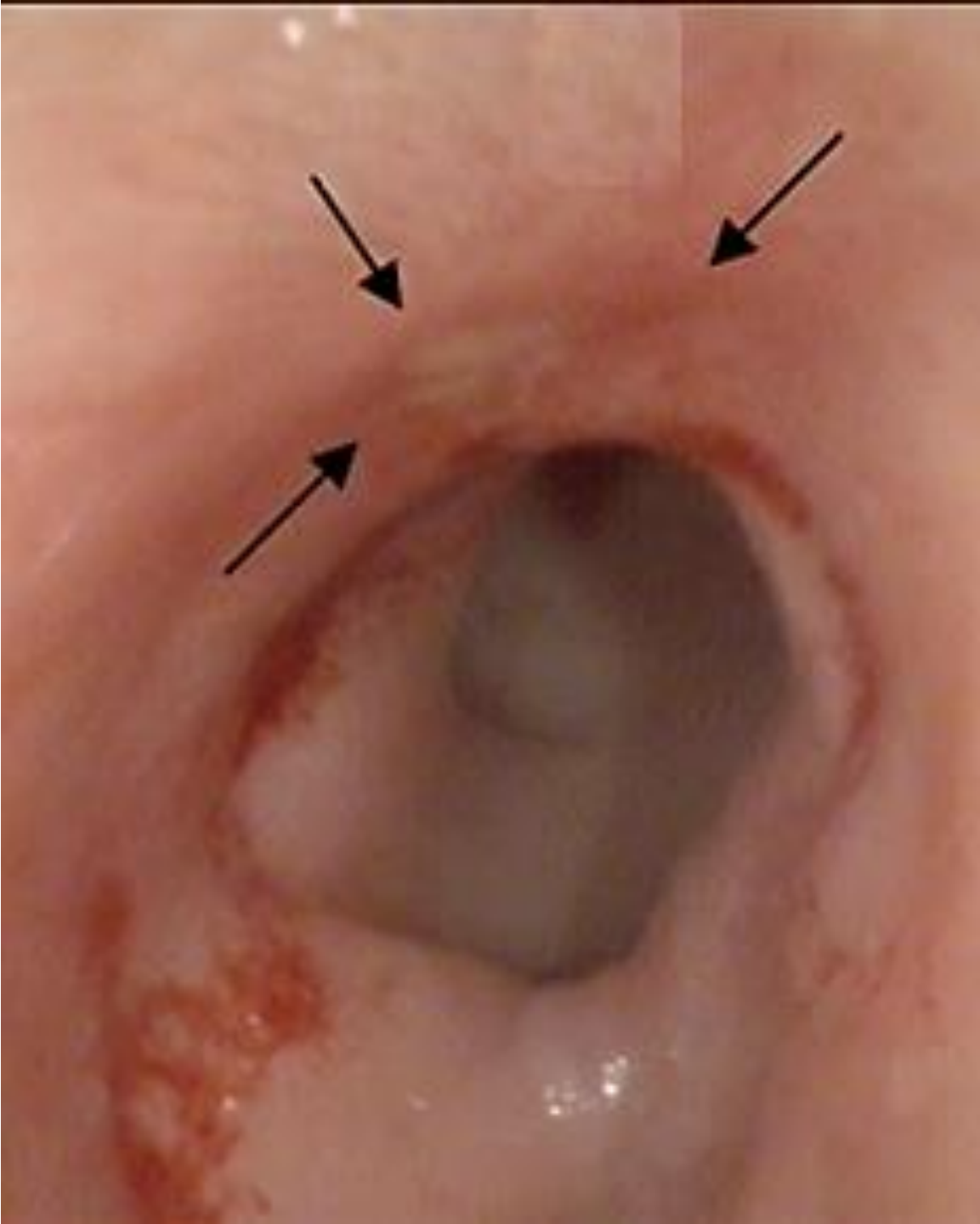


Clinical CR
(Endoscopic
evaluation)

Dynamic evaluation

Typical
endoluminal
image of CR:

**White scar with
telangiectasia.**



Clinical CR
(Endoscopic
evaluation)

- **Small ulcer
with smooth
surface**
without
residual
polypoid
tissue

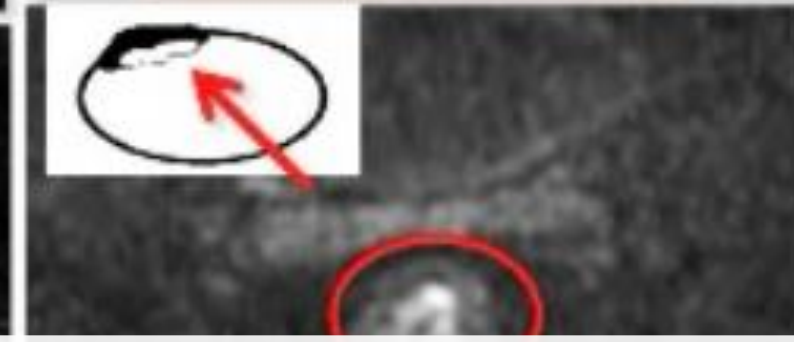
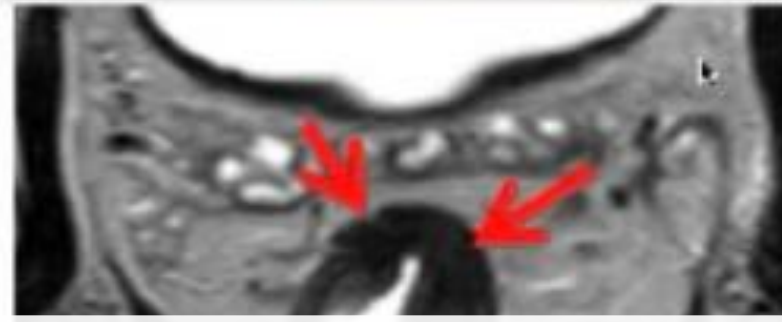
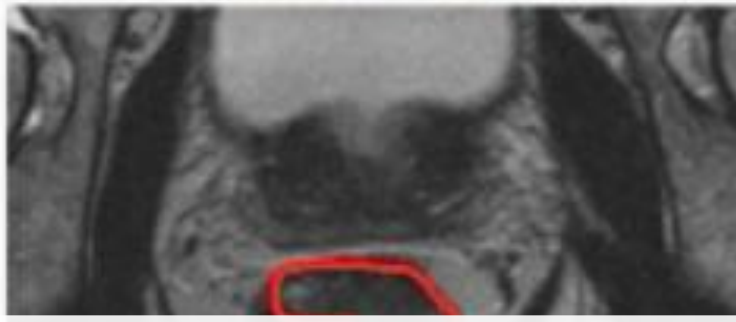
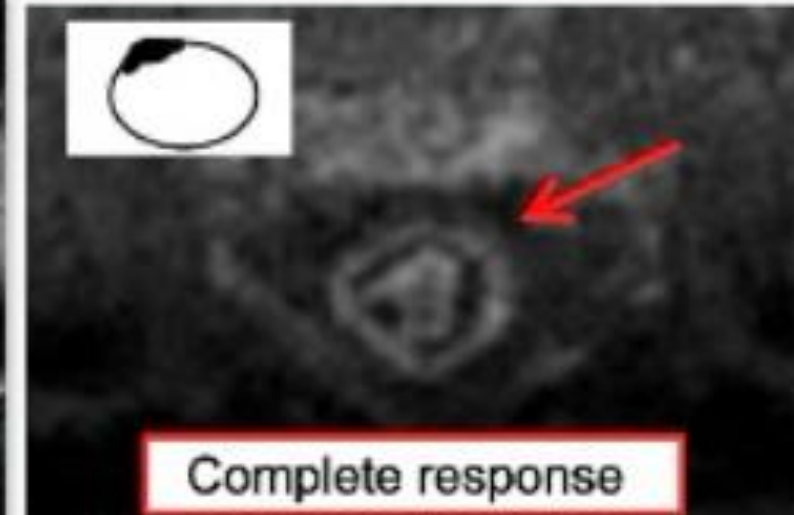
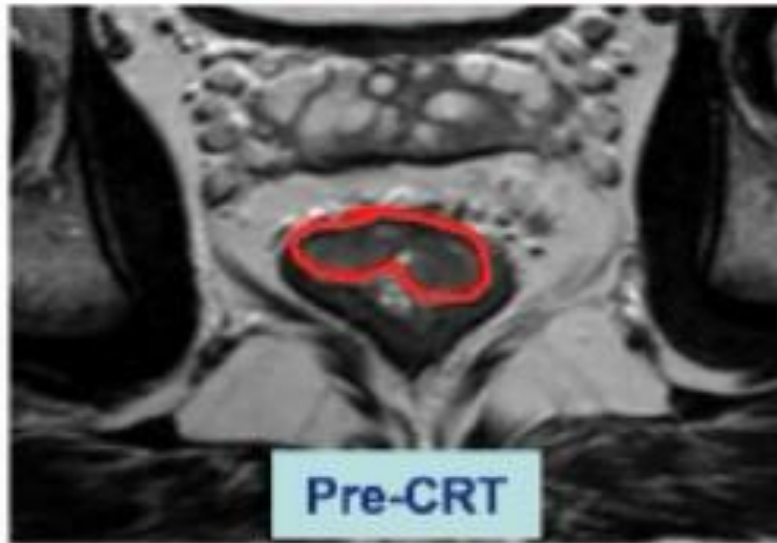
DWI MRI

DWI MRI → look for patterns

ypT0	DWI MRI
Sensitivity	94
Specificity	78
PPV	88
NPV	88

Semicircular fibrosis

Focal DWI signal → up to 90% accurate for residual disease



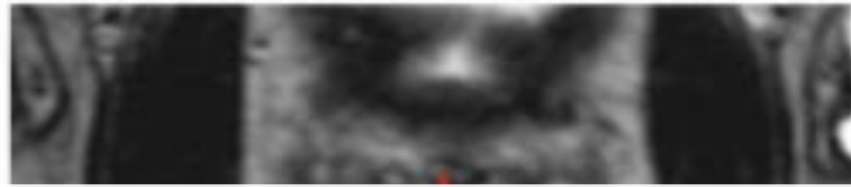
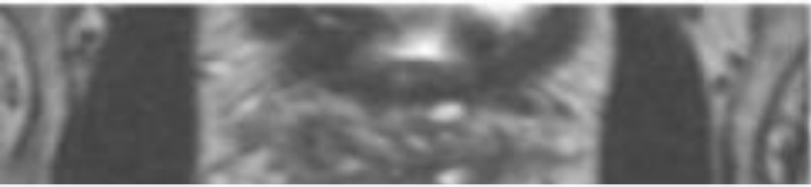
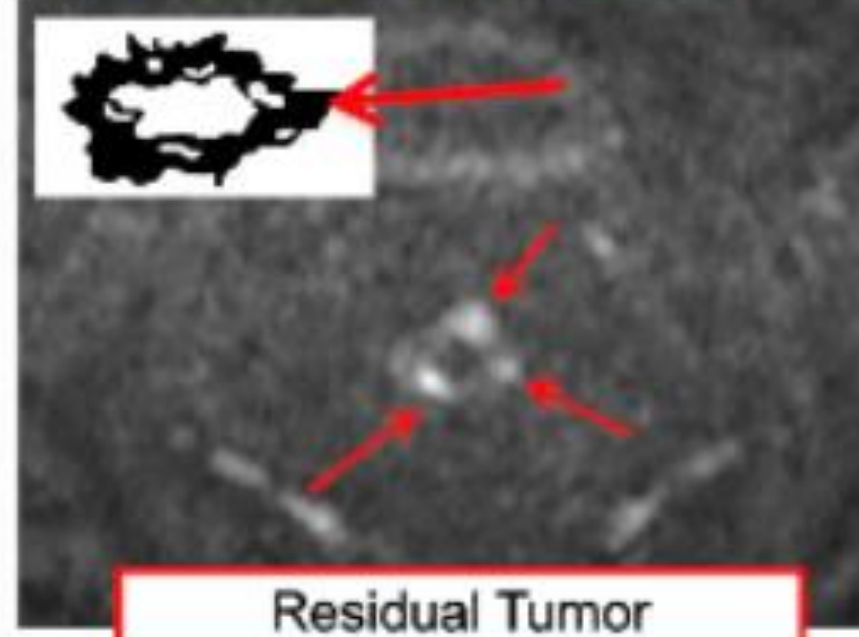
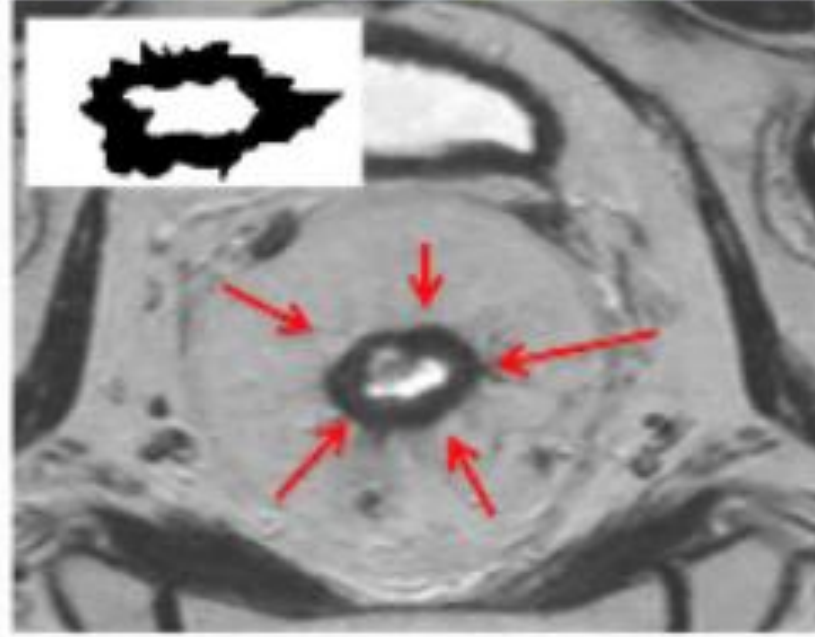
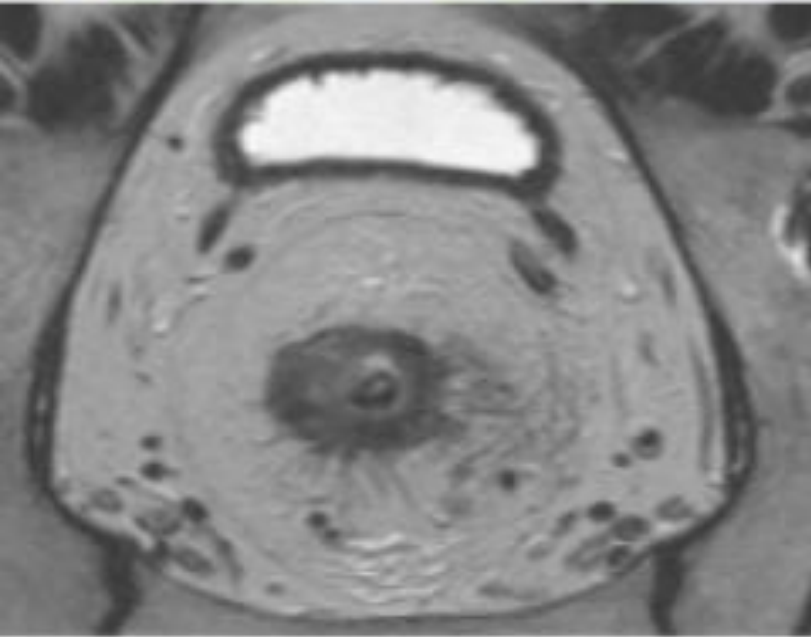
Semicircular pattern

Residual Tumor

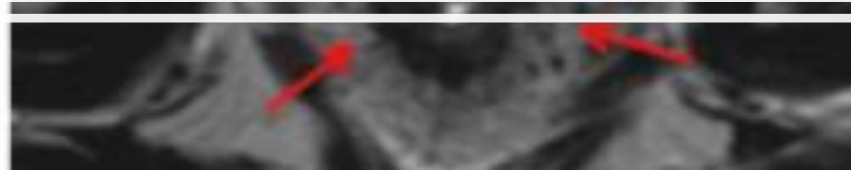
ANTONI VAN LEEUWENHOEK

Circular irregular fibrosis

80% risk for residual tumor regardless of DWI signal

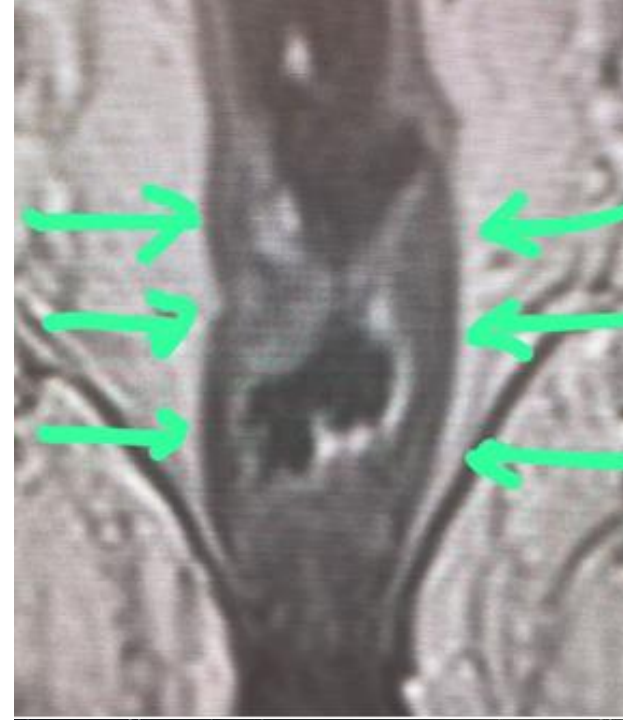


Circular pattern

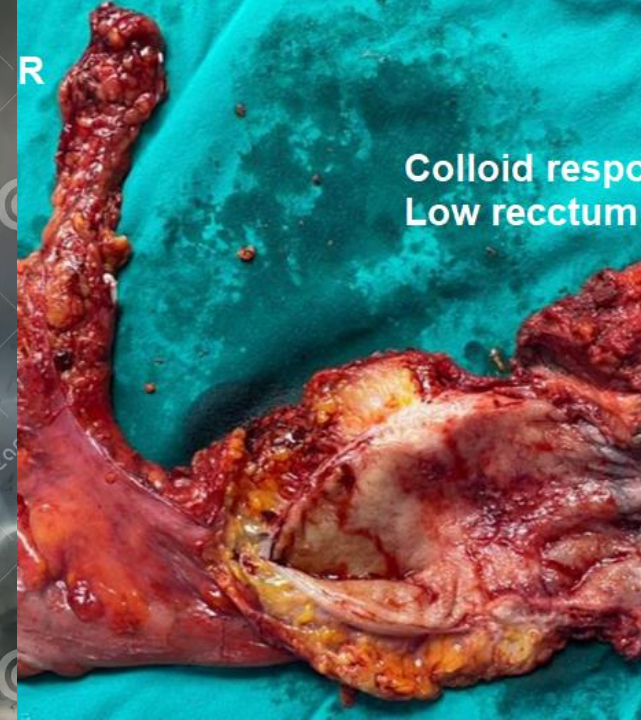


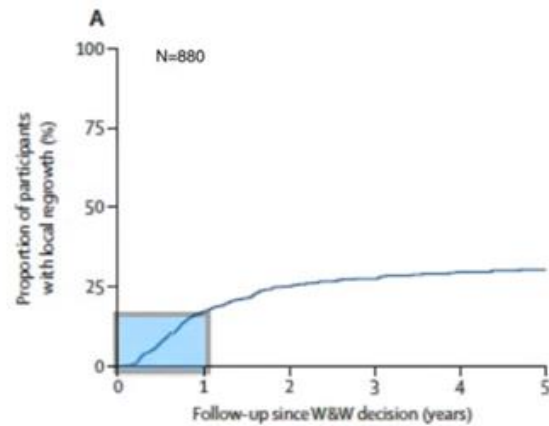
What are the risks of W & W

- **False negative** studies
- Unnecessary treatment **toxicity** QOL
- Reduction of chances to **Sphincter preserving strategies**
- **Regrowth**, salvage surgery not possible for all **7 %**.
- Regrowth risk of **distant metastases** **20 %**



Robotic TME ISR





Multicenter Study > [Lancet](#). 2018 Jun 23;391(10139):2537-2545.

doi: 10.1016/S0140-6736(18)31078-X.

Lancet 2018

Long-term outcomes of clinical complete responders after neoadjuvant treatment for rectal cancer in the International Watch & Wait Database (IWWD): an international multicentre registry study

- **25 %** Two-year local regrowth rate was
- **90 %** of all local regrowth was diagnosed in the first critical two years,
- **97 %** was located in the bowel wall.
- **85 %** Five-year overall survival
- **95 %** five-year disease-specific survival was.

Precision of Surgery

TME/ Beyond TME

Partial TME

APR/ ELAPR

ISR

SPECIMEN- BASED THINKING

Real-Time Specimen Audit

Smooth Shiny Envelope
Fascia is intact
No scalloping



Difficulty Rating Stars



Laparoscopic colectomy



Laparoscopic TME



Laparoscopic TME +Male



Laparoscopic TME +Male +BMI



Laparoscopic TME +Male +BMI + T3/4

SURGICAL DIFFICULTY

SIX KEY PARAMETERS

1

DURATION OF SURGERY



Longer operative time reflects increased technical complexity.



Indicator:
Total operative time (minutes)

2

BLOOD LOSS



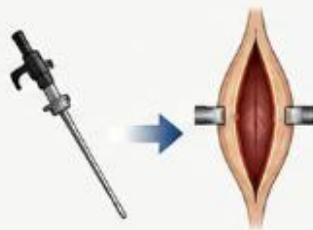
Higher blood loss indicates greater intraoperative challenge.



Indicator:
Estimated blood loss (mL)

3

CONVERSION RATE



Conversion to open surgery reflects intraoperative difficulty.



Indicator:
% of cases converted to open

4

LOWER QUALITY TME SPECIMEN



Poor mesorectal integrity increases risk of positive CRM and local recurrence.



Indicator:
Mesorectal grade (Circumferential integrity)

5

POSTOPERATIVE COMPLICATIONS



Higher complication rate reflects greater physiological and technical impact.



Indicator:
Clavien–Dindo $\geq$ Grade III (%)

6

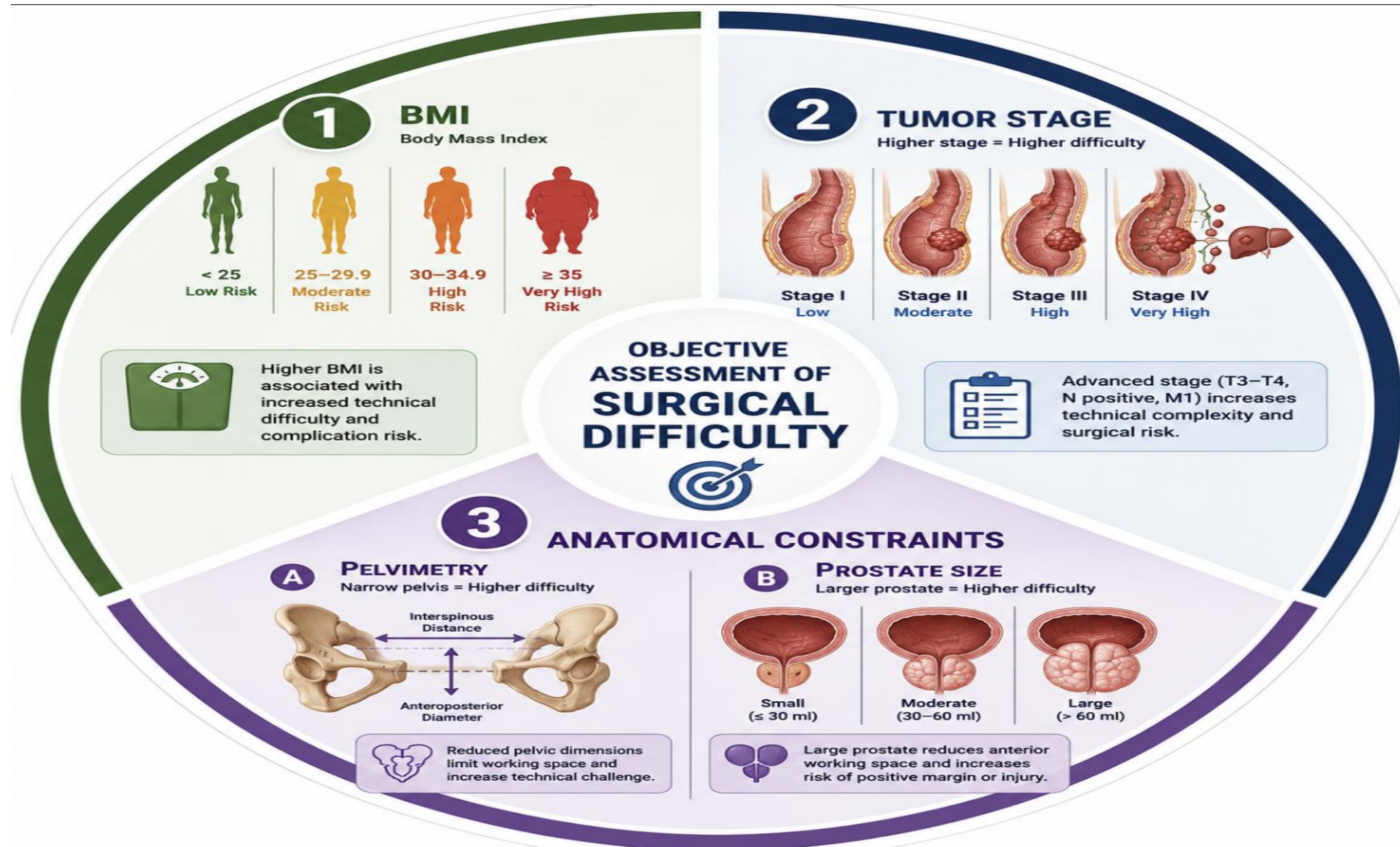
POSTOPERATIVE HOSPITAL STAY



Prolonged stay reflects recovery burden and surgical impact.



Indicator:
Length of stay (days)



Operation	Main indication	Mesorectal/pelvic extent
Partial TME / PME	Upper rectal cancer	Mesorectum divided ~5 cm distal to tumor
TME	Mid/low rectal cancer	Entire mesorectum to pelvic floor
ISR	Very low tumor requiring internal sphincter resection	TME + partial/complete internal sphincter
APR	Sphincter/levator involvement or unacceptable function after preservation	TME + anus/sphincter complex
ELAPE	Selected advanced low tumors where conventional APR risks CRM/perforation	Wider cylindrical pelvic-floor resection including levator
Beyond TME	Tumor extends outside conventional TME envelope	En-bloc compartmental/multivisceral resection

Types of Mesorectal Excision

Partial mesorectal excision — PME

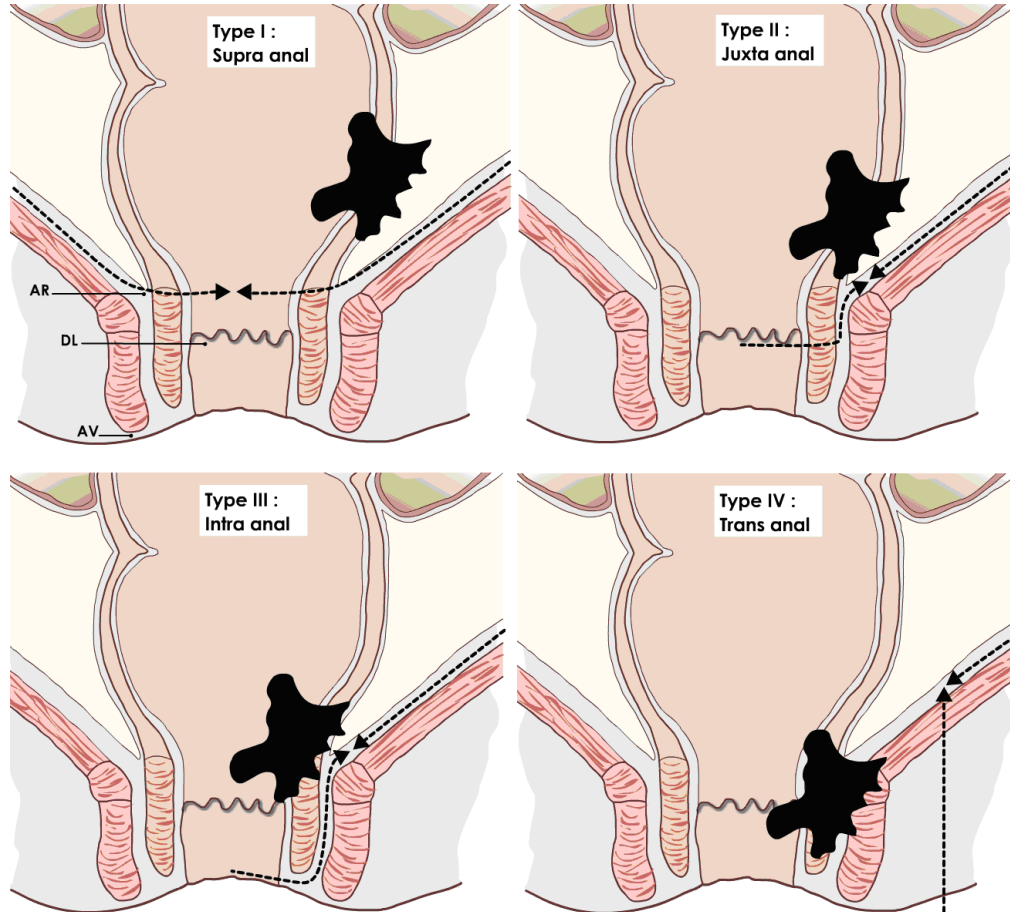
- **Upper rectal cancer** where the distal tumor edge is sufficiently proximal that complete removal of the distal mesorectum is unnecessary.
- The ASCRS guideline describes this as **Tumor-Specific Mesorectal Excision**, with division of the mesorectum ideally at least **5 cm distal to the tumor**.

Total mesorectal excision — TME

TME is the fundamental oncologic operation for **middle and lower rectal cancer**.

The rectum and mesorectum are removed intact within the mesorectal fascial envelope down to the pelvic floor.

Types of Inter sphincteric Resection



ISR is not an alternative to TME.
It is better understood as:
TME + extension of the distal resection into the intersphincteric plane to obtain a distal margin while preserving the external sphincter.

An oncologically compromised ISR is a failure of surgical judgment.

Types of APE

Abdominoperineal resection — APR

1. External sphincter involvement;
2. Levator involvement requiring removal;
3. Extensive intersphincteric involvement incompatible with R0 ISR;
4. Inability to obtain adequate distal/radial clearance with sphincter preservation
5. Severely compromised baseline continence where ultralow reconstruction would be inappropriate.

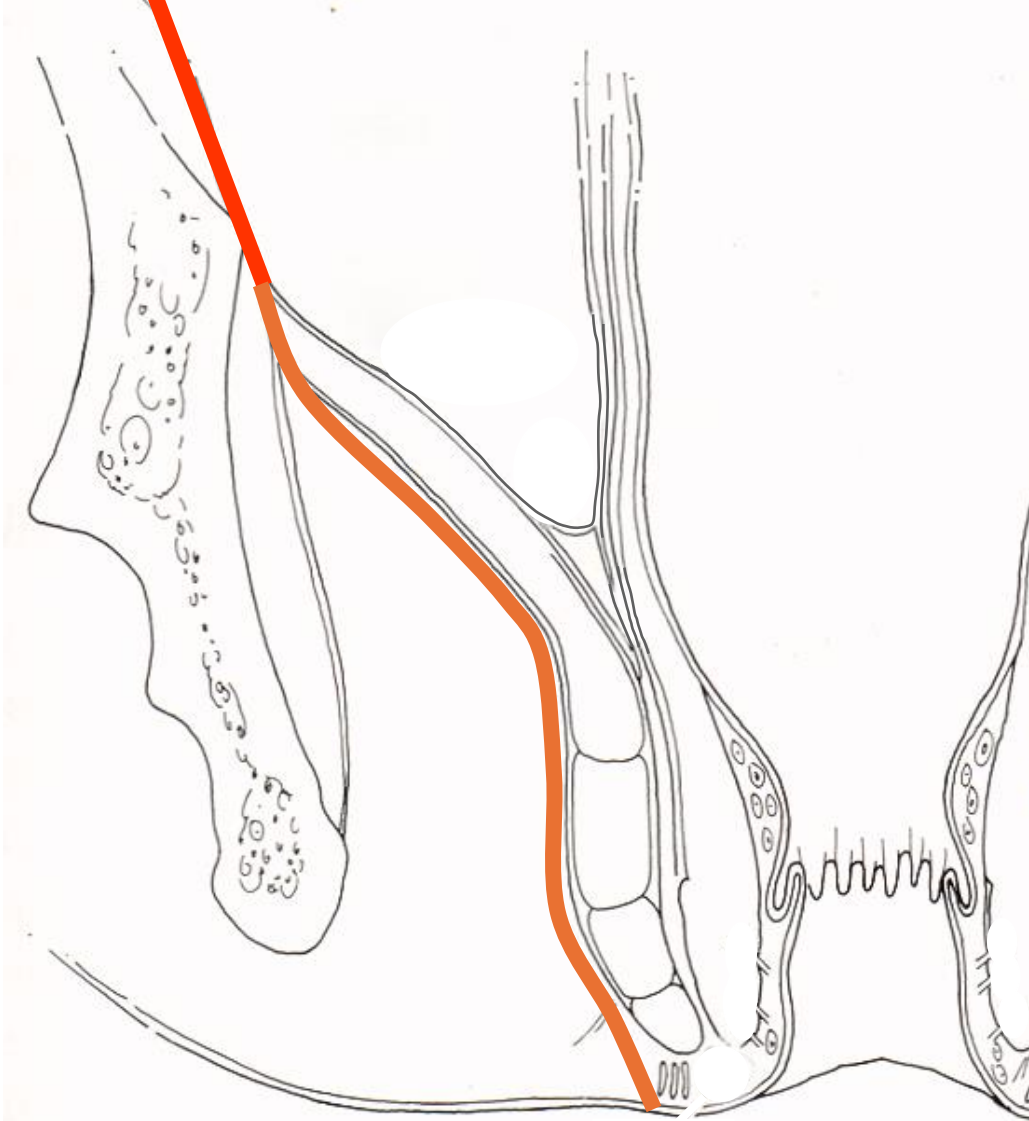
Extralevator APR — ELAPE

Dissection plane **laterally outside the levators.**

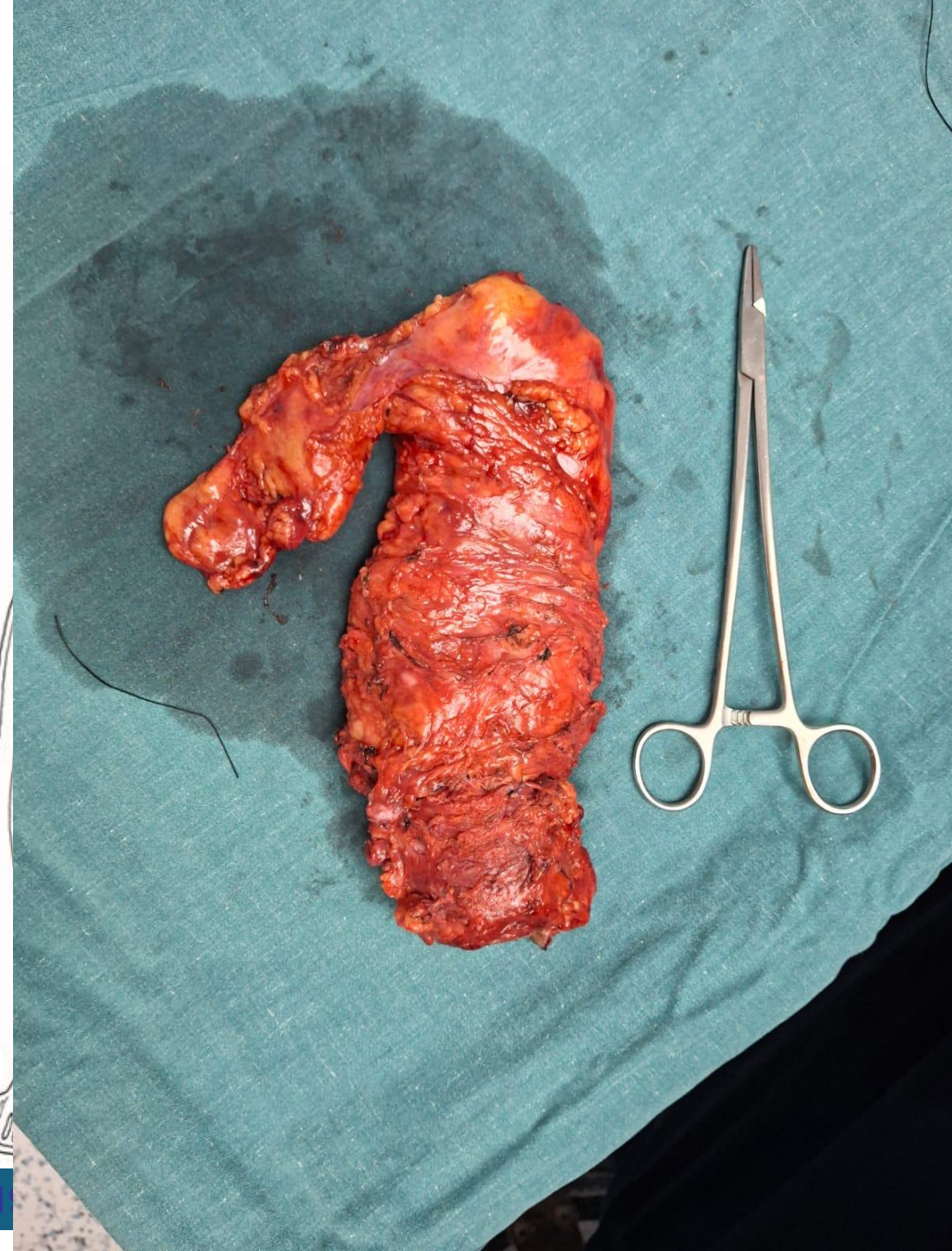
Conceptually:

- levator involvement; tumor extending toward the pelvic floor.
- threatened CRM at the level of the levators;
- Bulky low tumor with extension to ischiorectal fossa

Extra levator APR (Muscle wrap around TME)



Redrawn from Gordon & Nivatvongs QMP 1



Beyond TME plans (Plane Based Dissection)

ANZ Journal of Surgery

WILEY



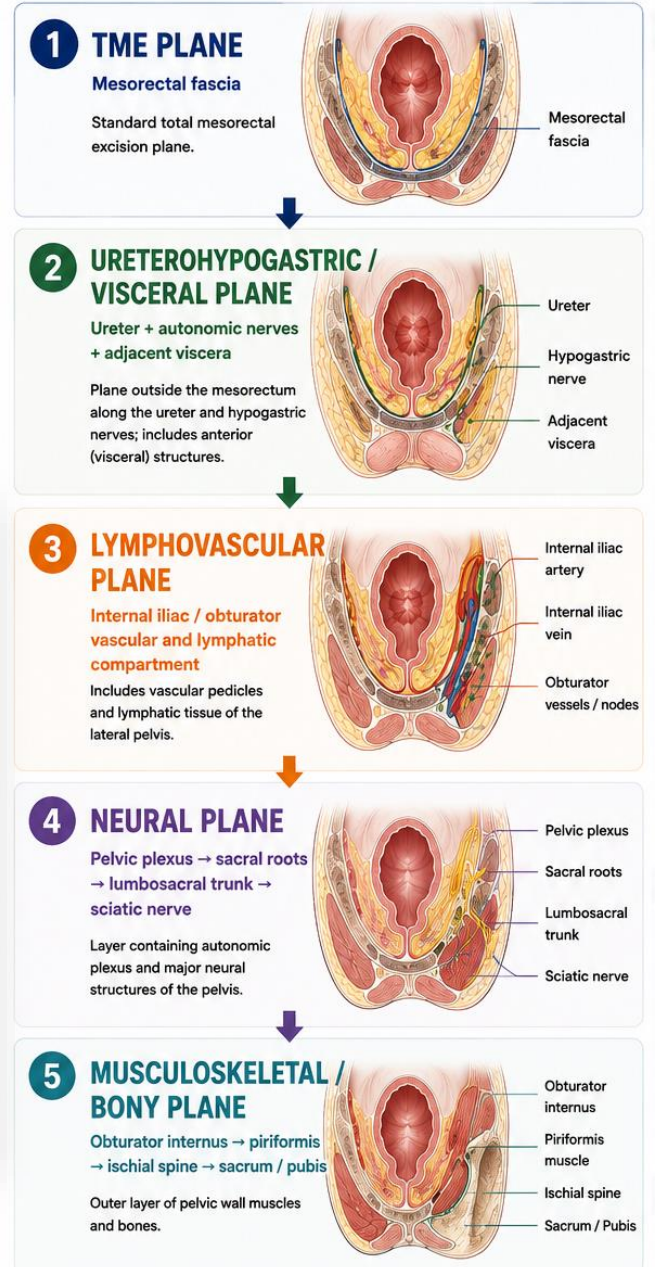
Royal Australasian
College of Surgeons

COLORECTAL SURGERY OPEN ACCESS

Layer by Layer: The Anatomical 'Onion Peel' Approach to Surgery Beyond Total Mesorectal Excision

Sean Davis^{1,2}  | Antonio Barbaro¹ | Zachary Bunjo^{1,2}  | Sergei Bedrikovetski²  | Tarik Sammour^{1,2} | Ryash Vather^{1,2}

¹Discipline of Surgery, Faculty of Health and Medical Sciences, School of Medicine, Adelaide University, Adelaide, South Australia, Australia | ²Colorectal Unit, Department of Surgery, Royal Adelaide Hospital, Adelaide, South Australia, Australia



WHEN TO MOVE FROM ONE SURGICAL TECHNIQUE TO ANOTHER

Key Transforming Situations in Rectal Cancer Surgery

MOVE FROM → TO
(Surgical Transition)

TRANSFORMING SITUATIONS
(Why the Change is Needed)

TME
(Standard)



BEYOND TME
(Next Plane)



ONCOLOGIC MARGIN THREATENED

Tumor reaches or breaches the mesorectal fascia; safe margin cannot be achieved within the TME plane.

ULTRA-LOW ANTERIOR RESECTION
(Sphincter Preserving)



ISR
(Intersphincteric Resection)



DISTAL MARGIN UNACHIEVABLE WITH CONVENTIONAL AR

Adequate distal margin requires removal of part or all of the internal sphincter.

ISR
(Intersphincteric Resection)



APR
(Abdominoperineal Resection)



SPHINCTER PRESERVATION NOT ONCOLOGICALLY SAFE OR FUNCTIONALLY MEANINGFUL

External sphincter / levator involved or poor expected function after ISR.

APR
(Conventional)



ELAPE
(Extralevator APR)



LEVATOR MUSCLES THREATENED OR INVOLVED

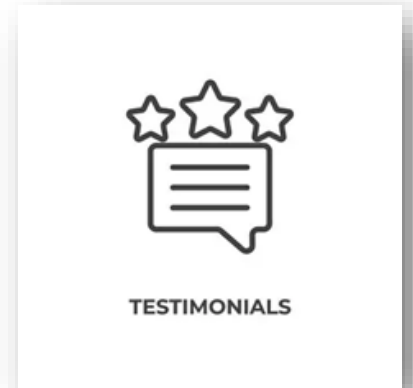
Conventional APR would leave a positive or inadequate radial margin.

Escalate the plane, Preserve the Patient

Life after Rectal Cancer Surgery

Communication is Superficial !

- Communication about what patients will truly face postoperatively is commonly **superficial**.
- Pre-operative phrases like "**your bowel habits may change**" do not prepare patients for the reality of Lower Anterior Resection Syndrome (LARS).
- For many of us (patients), LARS is not a minor inconvenience but a **hidden disability**.



Recovering from Rectal Tumors



1. Healthy Diet

- Eat mark-balanced meals.
- Eat meat-vegetable and fruits
- Stay away from foods that cause constipation
- Reduce sugar and fried foods.



2. Supportive Medications

- Follow your doctor's instructions on medications
- Do not discontinue medications without consulting your doctor
- Contact your doctor if new symptoms appear



3. Daily Behaviors

- Get enough sleep and rest
- Engage in moderate physical activity like walking
- Avoid smoking and excessive alcohol consumption



5. Psychological and Social Support

- Share experiences with family and friends
- Join support groups for people with similar experiences
- Join patient support-groups

6. Advanced Treatments

- Take advantage of modern methods of treatment
- Attend regular checkups regularly.



Recovery does not only mean physical healing, but also includes psychological healing and a gradual return to a better life.



The future of rectal cancer management is moving toward:

- Personalized treatment algorithms
- Increased utilization of Total Neoadjuvant Therapy
- Expanded organ preservation strategies
- Greater integration of robotic surgery
- Artificial intelligence-assisted imaging and response assessment

Thank you

