Pelvic Exenteration
*Initial Experience and Outcome*

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Consultant General and Colorectal Surgeon
Royal Medical Services
Jordan Armed Forces
the KHMC has five hospitals with a capacity of more than 900 beds.

Al-Hussein hospital: established in 1973, one of the busiest hospitals in Jordan with an annual admission rate of 25,000 patients.
colorectal unit

- established September 2008.
- 1 consultant, 6 fellows, 5 surgical residents (rotating every 3 months), 2 nurses, 1 dietician.
- one colorectal clinic and 2 days theater/week.
• on average 80 colorectal cancer surgeries/ year, third laparoscopy.

• ERAS implemented 2014.

• median hospital stay 4.4 days.
Disclosure

• I have no commercial relationship relevant to this presentation
• TME concept.
• rectal cancer: recurrent and advanced
• pelvic exenteration: definition and types
• our experience
rectal cancer: TME concept
in the 1980’s, Professor Richard J. Heald from Basingstock facilitated the adoption of total mesorectal excision
he described the “Holy Plane” of TME for mid and lower-third rectal tumors undergoing restorative resection, which led to only 3.7% local recurrence

this is in contrast to local recurrence rates of 14% to 40% in series published before the use of TME dissection

Heald R J, Ryall R DH. Lancet. 1986
• despite technical improvements including total TME and the addition of neoadjuvant therapies, locoregional recurrence has been found to have an incidence of up 10%

rectal cancer: recurrent and advanced
recurrent rectal cancer is difficult to manage because of the loss of surgical planes (TME plane) and invasion of pelvic structures.
• up to 10% of patients who undergo “curative” resection for rectal cancer develop recurrence.

• for recurrent rectal cancer and after R0 surgical resection the 5-year survival rate reaches 46%

• in the absence of surgical intervention, the mean survival is 7 months and the 5-year survival less than 5%.

• with radio-chemotherapy, median survival time is 14 months and time of local control is 5 months. Five-year survival rate in these patients is usually <5%

locally advanced rectal cancer that adheres to or invades adjacent organs accounts for approximately 10-25% of all primary rectal cancers

Yang et al. Dis Colon Rectum 2013
• after R0 resection the 3-year survival of 56.4% for locally advanced primary rectal cancer.

pelvic exenteration
• first described by Alexander Brunschwig in 1948 as a palliative procedure for advanced cervical cancer.

Brunschwig A. Cancer. 1948.
pelvic exenteration was described as "the most radical surgical attack so far described for pelvic cancer" and at the time had a post operative mortality rate of 23%.

Brunschiwig A. Cancer. 1948.

currently, operative mortality rates are 3-5%, and major perioperative complication rate is 30-44%

pelvic exenteration

- pelvic exenteration is an umbrella term that could be used to refer to:
  - anterior pelvic exenteration
  - posterior pelvic exenteration with/without sacrectomy
    - supra/infralevator
  - total pelvic exenteration with/without sacrectomy

- once the exenteration was completed, a phase of reconstruction follows
approach

• thorough clinical evaluation that is guided by information provided by MRI and PET-CT scans
• to balance the pros and cons of various parameters during evaluation
• to determine whether the procedure performed would lead to better quality-of-life outcomes
multidisciplinary team is required to assess:

• clinical symptoms
• the extent of local and distant disease
• fitness for operation
• adequate cognitive awareness and understanding of the postoperative rehabilitative process.
clinical symptoms

- “history of pain” and “pelvic bone pain” are both ranked as important symptoms by an expert panel in selecting patients suitable for PE.

- patients with intense pain often raise concerns of advanced pelvic disease with malignant infiltration of nerve roots and bone.

• Moore et al. found that central and anterior recurrences were more likely to have R0 resection


• various studies suggest that lateral pelvic sidewall recurrence is a very poor prognostic variable, with the inability to achieve R0 resection as one of the main deterring reasons

## Relative contraindications

<table>
<thead>
<tr>
<th>Relative contraindications</th>
<th>Absolute contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distant metastases</td>
<td>Encasement of external iliac vessels</td>
</tr>
<tr>
<td>Primary disease stage IV</td>
<td>Extension of tumor through the sciatic notch</td>
</tr>
<tr>
<td>Extensive pelvic sidewall involvement</td>
<td>Presence of lower limb edema from lymphatic or venous obstruction</td>
</tr>
<tr>
<td>Predicted R1 or R2 resection</td>
<td>Poor performance status</td>
</tr>
<tr>
<td>Sacral invasion above S2-S3</td>
<td></td>
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</tbody>
</table>

Mirnezami AH et al. *Dis Colon Rectum.* 2010
our experience
January 2016- June 2018
# Baseline Characteristics

## Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr), median (range)</td>
<td>59 (37-77)</td>
</tr>
<tr>
<td>Female: Male</td>
<td>12: 1</td>
</tr>
<tr>
<td>Primary site</td>
<td></td>
</tr>
<tr>
<td>Colorectal</td>
<td>12</td>
</tr>
<tr>
<td>Gynecological</td>
<td>2</td>
</tr>
<tr>
<td>Tumor classification</td>
<td></td>
</tr>
<tr>
<td>Primary advanced</td>
<td>10</td>
</tr>
<tr>
<td>Recurrent</td>
<td>4 (2 GI, 2 Gyne)</td>
</tr>
<tr>
<td>Type of operation</td>
<td></td>
</tr>
<tr>
<td>posterior PE</td>
<td>10</td>
</tr>
<tr>
<td>posterior PE with sacrectomy</td>
<td>2</td>
</tr>
<tr>
<td>total PE</td>
<td>2</td>
</tr>
<tr>
<td>Preoperative CRT</td>
<td>6</td>
</tr>
<tr>
<td>Radiality</td>
<td></td>
</tr>
<tr>
<td>R0</td>
<td>11</td>
</tr>
<tr>
<td>R1</td>
<td>1</td>
</tr>
<tr>
<td>Not stated</td>
<td>2</td>
</tr>
<tr>
<td>Mean operative time, hours</td>
<td>6.6 (5.1-8.1)</td>
</tr>
</tbody>
</table>
neoadjuvant radiochemo-therapy not used in 8 cases:
- recurrent gynecological - 2
- recto-sigmoid - 3
- recurrent GI - 2
- not tolerated - 1
<table>
<thead>
<tr>
<th>variable</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumor type</td>
<td></td>
</tr>
<tr>
<td>adenocarcinoma</td>
<td>12</td>
</tr>
<tr>
<td>cervical squamous cell</td>
<td>1</td>
</tr>
<tr>
<td>uterine carcinosarcoma</td>
<td>1</td>
</tr>
<tr>
<td>Tumor differentiation</td>
<td></td>
</tr>
<tr>
<td>well</td>
<td>0</td>
</tr>
<tr>
<td>moderate</td>
<td>7</td>
</tr>
<tr>
<td>poor</td>
<td>5</td>
</tr>
<tr>
<td>not mentioned</td>
<td>2</td>
</tr>
<tr>
<td>Lymphovascular invasion</td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>5</td>
</tr>
<tr>
<td>no</td>
<td>6</td>
</tr>
<tr>
<td>not mentioned</td>
<td>3</td>
</tr>
<tr>
<td>Perineural invasion</td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>3</td>
</tr>
<tr>
<td>no</td>
<td>5</td>
</tr>
<tr>
<td>not mentioned</td>
<td>6</td>
</tr>
</tbody>
</table>
– post operative complications 57%
  • infected wound 2
  • entero-cutaneous fistula 1
  • high output stoma with dehydration with readmission 1
  • vaginal stump infection 1
  • urinary leak 1
  • UTI 1
  • persistent perineal sinus 1

– 30 day mortality 15.4% (2 patients, MI, PE)
– 30 month disease free survival 46% (6 pts)
Nabeel

- 69 years old male
- mid rectal tumour, cT3N2M0
- completed neoadjuvant October 2015
- refused surgery, missed golden period
- operated June 2016
- total pelvic exenteration with end colostomy and ileal conduit
- R0 resection
Pathology No.: S167068
Specimen: Rectosigmoid colon
Clinical Information:
Rectal tumor invading the bladder

Gross Description:
This specimen composed of sigmoid measuring 12cm and rectum measuring 12cm.
The outer surface of the specimen shows adherent part of urinary bladder measuring 7x8cm., prostate measuring 4x3x3cm and seminal vesicles measuring 3x2cm.
On opening, there is a huge mass measuring 7cm and located 5cm away from nearest distal margin with mucus at surface.
The tumor grossly is located near to the circumferential margin at the lateral and posterior surface.

Microscopic Description:
- Histologic type: Mucinous adenocarcinoma
- Microscopic tumor extension
The tumor is adherent to the wall of urinary bladder with focal area of microscopic invasion.
Also the tumor is adherent to the seminal vesicles.
- Margins: Both proximal and distal margins are free of tumor.
- The circumferential margin of lateral and posterior surface located 0.2cm from the tumor.
- Lymphovascular space invasion: Absent
- Perineural invasion: Not identified
- Tumor deposits: Absent
- Regional lymph nodes: (17) examined
  (0) involved
- Others: The prostate is unremarkable

Final Diagnosis:
Rectosigmoid colon:
- Invasive mucinous adenocarcinoma invading the urinary bladder wall and located 0.2cm away from the circumferential margin.
- AJCC 7th edition: T4bNO
Basema

- 56 years old female patient
- post neoadjuvant radio-chemotherapy
- posterior pelvic exenteration with sacrectomy.
- R0 resection
- missed adjuvant chemotherapy because of wound infection
- pelvic recurrence after > 1 year with lung metastasis and primary left breast cancer
Gross Description:

Microscopic Description:

- Histologic type: Invasive mucinous adenocarcinoma
- Histologic grade: Moderately differentiated
- Microscopic tumor extension: The tumor infiltrates through the full thickness of rectal wall and directly invades the vaginal wall and presacral soft tissue.
  **Margins:** Proximal, distal and circumferential margins are negative for tumor. There was no evidence of sacral bone infiltration.
- Treatment effect: Grade 2
- Lymph vascular invasion: Not identified
- Perineural invasion: Not identified
- Tumor deposits: Multiple perirectal tumor deposits identified
- Additional pathologic findings:
  - The cervix shows chronic cervicitis
  - The endometrium shows weakly proliferative phase
  - The myometrium shows adenomyosis
  - Both fallopian tubes show active chronic salpingitis
  - Both ovaries are unremarkable.
- Regional lymph nodes: 1 out of 5 identified lymph nodes contains metastatic carcinoma however some tumor nodules in the fat could represent additional replaced nodes.
- Tumor border configuration: Pushing (expansile)
- AJCC classification: pT4b and at least N1.

Final Diagnosis:
Rectal tumor, AP resection + TAH and BSO + partial sacrectomy:
- Residual invasive moderately differentiated rectal mucinous adenocarcinoma invading the full thickness of rectal wall into the vaginal wall with nodal metastasis and multiple pericolic tumor deposits.
- AJCC classification (7th ed) TNM stage: pT4b and at least N1.
<table>
<thead>
<tr>
<th></th>
<th>Systematic review by Yang et al.</th>
<th>Our data</th>
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</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>1049 (23 studies)</td>
<td>13</td>
</tr>
<tr>
<td>median age (range, years)</td>
<td>59 (52-64)</td>
<td>59 (37-77)</td>
</tr>
<tr>
<td>R0 resection margin (range %)</td>
<td>73 (42-100)</td>
<td>78.6%</td>
</tr>
<tr>
<td>complication rate (range, %)</td>
<td>57 (37-100)</td>
<td>57%</td>
</tr>
<tr>
<td>30 day mortality (range %)</td>
<td>2.2 (0-25)</td>
<td>15% (2 pts)</td>
</tr>
<tr>
<td>local recurrence (range %)</td>
<td>22 (4.8-61)</td>
<td>15% (2 pts)</td>
</tr>
<tr>
<td>5-year survival (range %)</td>
<td>52 (31-77)</td>
<td>---</td>
</tr>
</tbody>
</table>

Yang et al. Dis Colon Rectum 2013
current limitations

• poor quality MRI
• general radiologist with interest in MRI
• all decisions made by the colorectal team
• absence of multidisciplinary team
  – usually an individual consultation sent to urologist, plastic surgeon, orthopedic, oncologist etc.
• no dedicated nurse or physiotherapist
• our cases are mainly axial or central recurrences/advance primaries, which are easier to deal with and has better chances of R0 resection than lateral pelvic side wall involvement
areas of improvement

• improve MRI quality
• dedicated pelvic MRI radiologist with standardized reporting
• dedicated multidisciplinary team that includes all the specialists involved in the management of these complex cases
• better selection criteria
• improved and standardized pathology reporting
• our data is comparable to literature
• mortality is high, necessitates better patients selection
• longer follow up time will clarify local recurrence and 5-year survival
pelvic exenteration should stay an option for patients with locally advanced or recurrent rectal or pelvic cancers to achieve an acceptable 5-year disease free survival with adequate quality of life
Thank you