A Comparative Study Among Elective Conventional Surgery, Urgency/Emergency Conventional Approaching and Elective Videolaparoscopic Surgery on the Treatment of Hospitalized Patients at First Surgeric Clinic of Federal Hospital of Bonsucesso with a Diagnostic of Colorectal Adenocarcinoma, between January 2010 and December 2012.

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Study Population

• Patients with colorectal adenocarcinoma who underwent surgery in the years 2010, 2011 and 2012 in the 1st Surgical Clinic of the Federal Hospital Bonsucesso

• Surgeries:

1. Conventional Approach to Emergency
2. Conventional Elective Surgery
3. Elective Laparoscopic Surgery
Data Collection

- Pre-selection of histopathological reports in Anatomic Pathology Service (March-July / 2013)

- Selection with data collection in Medical Records (August / 2013 - May / 2014) grouped according to the surgery performed
Data Collection

Selected data

- Sex
- Age
  - up to 39 years
  - 40 to 65 years
  - over 65 years
- TNM stage
- Length of Stay
  - Up to 15 days
  - 15 to 30 days
  - 30 to 40 days
  - more than 40 days

- Complications
# Clavien Classification

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Any deviation from the normal postoperative course without the need for pharmacologic treatment or surgical, endoscopic, and radiologic interventions. Allowed therapeutic regimens include drugs such as antiemetics, antipyretics, analgesics, diuretics, electrolytes, and physiotherapy.</td>
</tr>
<tr>
<td>2</td>
<td>Complications requiring pharmacologic treatment with drugs other than allowed for Grade 1 complications. Blood transfusions and total parenteral nutrition are also included.</td>
</tr>
</tbody>
</table>
| 3     | Complications requiring surgical, endoscopic, or radiologic intervention.  
  
  Grade 3a: Intervention not under general anesthesia  
  Grade 3b: Intervention under general anesthesia |
| 4     | Life-threatening complications (including central nervous system complications) requiring intensive care unit stay  
  
  Grade 4a: Single-organ dysfunction (including dialysis)  
  Grade 4b: Multiorgan dysfunction |
| 5     | Death of the patient |
Outcomes

- Selected sample: 227 patients
Outcomes - Emergency

Age

- up to 39 years: 8.33%
- 40 to 65 years: 66.66%
- over 65 years: 25%

AVERAGE AGE: 55.666
MEDIAN AGE: 57.000
STANDARD DEVIATION OF AGE: 15.465
Outcomes - Emergency

Length of Stay

- 83.33% for 15 days
- 8.33% for 15 to 30 days
- 0.00% for 30 to 40 days
- 8.33% for more than 40 days
Outcomes - Emergency

Complications

- No complications: 54.16%
- Grade I: 4.16%
- Grade II: 8.33%
- Grade IIIa: 0%
- Grade IIIb: 4.16%
- Grade IVa: 0%
- Grade IVb: 8.33%
- Grade V: 20.83%
Outcomes - Emergency

Staging

- Stage I: 8.33%
- Stage IIA: 12.5%
- Stage IIB: 8.33%
- Stage IIIB: 25%
- Stage IIIC: 25%
- Stage IV: 0%
- Not found: 1%

Outcomes - Emergency
Outcomes – Conventional Elective Surgery

- AVERAGE AGE: 64,348
- MEDIAN AGE: 66,000
- STANDARD DEVIATION OF AGE: 12,684
Outcomes – Conventional Elective Surgery

Length of Stay

- 15 days: 27.51%
- 15 to 30 days: 41.61%
- 30 to 40 days: 13.42%
- More than 40 days: 17.44%
Outcomes – Conventional Elective Surgery

Complications

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No complications</td>
<td>26.17%</td>
</tr>
<tr>
<td>Grade I</td>
<td>16.10%</td>
</tr>
<tr>
<td>Grade II</td>
<td>13.42%</td>
</tr>
<tr>
<td>Grade IIIa</td>
<td>4.02%</td>
</tr>
<tr>
<td>Grade IIIb</td>
<td>8.72%</td>
</tr>
<tr>
<td>Grade IVa</td>
<td>5.36%</td>
</tr>
<tr>
<td>Grade IVb</td>
<td>5.36%</td>
</tr>
<tr>
<td>Grade V</td>
<td>20.88%</td>
</tr>
</tbody>
</table>
Outcomes – Conventional Elective Surgery

Staging

<table>
<thead>
<tr>
<th>Stage</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>10.06%</td>
</tr>
<tr>
<td>Stage IIA</td>
<td>8.72%</td>
</tr>
<tr>
<td>Stage IIB</td>
<td>14.76%</td>
</tr>
<tr>
<td>Stage IIIA</td>
<td>2.01%</td>
</tr>
<tr>
<td>Stage IIIB</td>
<td>3.35%</td>
</tr>
<tr>
<td>Stage IIIC</td>
<td>16.77%</td>
</tr>
<tr>
<td>Stage IV</td>
<td>12.08%</td>
</tr>
<tr>
<td>Not Found</td>
<td>32.21%</td>
</tr>
</tbody>
</table>
Outcomes – Elective Laparoscopic Surgery

<table>
<thead>
<tr>
<th>AVERAGE AGE</th>
<th>61,833</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDIAN AGE</td>
<td>63,000</td>
</tr>
<tr>
<td>STANDARD DEVIATION OF AGE</td>
<td>12,319</td>
</tr>
</tbody>
</table>
Outcomes – Elective Laparoscopic Surgery

Length of Stay

- 15 days: 33.33%
- 15 to 30 days: 51.85%
- 30 to 40 days: 9.25%
- More than 40 days: 5.55%
Outcomes – Elective Laparoscopic Surgery

Complications

- No Complications: 53.70%
- Grade I: 14.81%
- Grade II: 18.51%
- Grade IIIa: 0%
- Grade IIIb: 0%
- Grade IVa: 3.70%
- Grade IVb: 0%
- Grade V: 9.25%

Elective Laparoscopic Surgery
Outcomes – Elective Laparoscopic Surgery

Staging

<table>
<thead>
<tr>
<th>Stage</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>25.92%</td>
</tr>
<tr>
<td>Stage IIA</td>
<td>11.11%</td>
</tr>
<tr>
<td>Stage IIB</td>
<td>9.25%</td>
</tr>
<tr>
<td>Stage IIIA</td>
<td>1.85%</td>
</tr>
<tr>
<td>Stage IIIB</td>
<td>7.40%</td>
</tr>
<tr>
<td>Stage IIIC</td>
<td>11.11%</td>
</tr>
<tr>
<td>Stage IV</td>
<td>11.11%</td>
</tr>
<tr>
<td>Not Found</td>
<td>22.22%</td>
</tr>
</tbody>
</table>
The groups were compared by evaluating the comparative significance of the variables.

Statistical evaluation highlighted three variables:

- **Length of stay** ($p$-value = 0.000004970)
- **Complications** ($p$-value = 0.04734)
- **Staging** ($p$-value = 0.002072)
It is not only important to embrace the advantages but also to understand its limitations and complications.
Complications Related to Trocars

- **Insertion**
  - Minimal violation of the anterior peritoneum
  - Patient-specific factors decides which method to use
  - Dreaded complication: missed intestinal injury
  - Dense adhesions suspected: choose an entry site away from the prior incision
Complications Related to Trocars

• Bleeding Port Sites

- Piercing or laceration of vessels traversing the abdominal wall during trocar placement is generally the cause

- The most common vascular injury: inferior epigastric vessels

- Methods to control bleeding: suture placement around the trocar site, standard electrocautery or port removal with direct suture ligation
Complications Related to Trocars

- Adhesions and Port-site Hernias
  - Intra-abdominal adhesions in laparoscopic intestinal surgery are reduced

Taylor GW and colleagues: “Adhesions and incisional hernias following laparoscopic versus open surgery for colorectal cancer in the CLASSIC trial.” [Br J Surg 2010]

There was an increase in rates of both adhesions and hernia complications among patients whose procedure was converted from a laparoscopic approach to open
Complications Related to Trocars

- **Port-site Tumor Recurrence**

  Reported rates of port-site tumor recurrences early in the experience of laparoscopic surgery for colon cancer were as high as 21%

  It appears that the previously unexpected high rates of port tumor recurrences are not observed in the latest updates of all large randomized controlled trials.
Intra-abdominal Complications

- Leak Rates Relative to Technique of Anastomosis
  - Anatomic location within the bowel
  - Anatomy
  - Mesenteric mobility
  - Bacterial load differ by location along the lower gastrointestinal tract
  - Tension
  - Blood supply
Intra-abdominal Complications

**SIGNIFICANT BENEFITS FROM LAPAROSCOPY**

1. Earlier return of bowel function
2. Decreased postoperative pain
3. Shorter length of stay
4. Lower late morbidity rates
5. Reduced ileus
6. Lower estimated blood loss
7. Lower transfusion rate
8. Lower wound infections
Intra-abdominal Complications

- *Injury to the Genitourinary Tract* → the incidence of urinary tract injuries increases in patients with:
  
  - Prior pelvic operations
  - Inflammatory bowel disease
  - Infection
  - Patients with extensive neoplasms that can cause distortion of normal surgical planes
Conversion

Conversion from laparoscopic to open surgery is affected by variety of patient-related, as well as surgeon-related factors.

Patient-related factors:

1. Dense interloop adhesions
2. High body mass index
3. Advanced tumor with local invasion
4. Inflammatory conditions
Conversion

Marusch F and colleagues: “Importance of conversion for results obtained with laparoscopic colorectal surgery.”

[Dis Colon Rectum 2006]

Patients who were converted during laparoscopic colectomies when compared with those who had successful laparoscopic colectomies had longer operative time, increased blood loss, higher wound infection rate and longer length of stay.
Conversion

Belizon and colleagues: “Converted laparoscopic colectomy: what are the consequences?”
[Surg Endosc 2006]

Clinical impact of conversion also depends on whether the case is converted early (< 30 minutes) or late

Early Proactive Conversion X Reactive Conversion

Favorable outcome in high-risk patients
Intraoperative complications and poorer outcomes
Conclusions

Most patients undergoing emergency surgery had a shorter length of stay \((p\text{-value} = 0.00000497)\).
Conclusions

• The group operated by laparoscopy had lower incidence of complications when compared to elective laparotomy group \((p-value = 0.002072)\)

• Conventional elective surgeries: the percentage of deaths was high
Conclusions

• Many patients undergoing laparoscopic surgery were in the earliest stages of the disease. And, conversely, a high percentage of patients undergoing emergency surgery was in the advanced stages of the disease ($p$-value = 0.047)
Key-Points

1. Laparoscopic colorectal surgery may be comparable to open techniques when considering oncological and long-term follow-up outcomes

2. Although fewer perioperative complications and faster postoperative recovery of laparoscopy, it does possess a unique set of complications

3. Complications resulting from conversion of procedures from laparoscopic-to-open may lead to worse outcomes than complications from open surgery alone
Thank You!