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# Efficacy of fast track protocols in patients undergoing elective surgery

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**Abstract**
**Background:** Fast track protocols are a multidisciplinary structured approach which provides standardized evidence-based components of care to patients undergoing specific types of surgery. The aim of this work was to compare fast track to traditional care following elective surgery regarding the impacts on hospital stay, postoperative pain, mobilization and feeding resumption.
**Methods:** This prospective, non-randomized, comparative, open-label trial was carried out on 74 patients aged more than 18 years old, both sexes, with elective pathological lesions requiring elective surgical intervention, and classified as American Society of Anaesthesiologists (ASA) class I, II and III. Patients were divided into two equal groups: Group I: Fast track group, Group II (control group): Conventional group.
**Results:** A statistically significant higher usage of multimodal analgesia ($p$<0.001)) and lower nasogastric tube insertion in fast-track group compared to conventional care group was found ($p$<0.001). Feeding resumption and drain removal was earlier in fast-track group with lower pain score using pain scaling rates. no significant difference between both groups in postoperative complications.
**Conclusions:** The Fast track protocols are effective and safe in elective settings.

**Keywords:** Laparotomy; elective; pain analogue score

## Introduction
Fast track protocols are a methodical approach that provides standardized, evidence-based treatment options to patients undergoing certain surgical procedures [1].
Aspects of fast-track protocols include pre, intra, and postoperative phases [2]. Preoperative components include thorough preoperative counselling, avoiding prolonged fasting, avoiding mechanical colon preparation, using prebiotics and carbohydrate loading, and maybe using epidural or intrathecal analgesia in fast track protocols pathways. Maintaining normothermia and strict fluid balance to prevent fluid overload are examples of intra-operative components. A few post-operative strategies are early mobilization, faster enteral feeding, avoidance of routine nasogastric tube insertion, reduced usage of peritoneal drains, and early urine catheter removal. Multimodal analgesia with low opiate use is also recommended [3].
King *et al*. [4] discussed the influence of a fast-track protocols on clinical outcome, cost and quality of life after surgery for colorectal surgery. They found that hospital stay was significantly reduced when patients were managed according to a fast-track protocols, with a 49% reduction in length of stay in the fast-track group compared to the conventional care arm (p= 0.05).
The aim of this work was to compare fast track care to traditional care following elective surgeries regarding the impacts on hospital stay, postoperative pain and feeding resumption.

## Patients and Methods
0This prospective, comparative, open-label trial was carried out on 74 patients attended The GIT Surgery unit, General Surgery Department of Tanta University, Egypt. Patients aged more than 18 years old, both sexes, with elective pathological lesion requiring surgical intervention.
An informed written consent was obtained from the patient or relatives of the patients. The study was done after approval from ethical committee, Faculty of Medicine, Tanta University, from July 2022 to July 2023.

Exclusion criteria were pregnancy, severe chronic comorbidities, laparoscopic surgeries, patients classified as American Society of Anaesthesiologists (ASA) class IV or V and emergent cases. Patients were divided into two equal groups: Group I: Fast track group, group II (Control group): conventional group.

**Pre-operative**

**Fast Track**

Nil by mouth of 4 hours for solids and 2 hours for clear fluids, less foley's catheter and nasogastric tube insertion, venous thromboembolism (VTE) prophylaxis, antiemetics, antimicrobial prophylaxis, and control patient's comorbidities.

**Conventional**

Nil by mouth of at least 8 hours, more frequent use of foley's catheter, and nasogastric tube, VTE prophylaxis, antiemetics, antimicrobial prophylaxis according to surgeon' preference

**Intra-Operative**

**Fast track**

Regional anaesthesia in the form of epidural analgesia, strict intra-operative fluids management, less use of intra-abdominal drains, and active warming.

**Convectional**

Regional anaesthesia: according to operator preference, routine intra-operative fluids management, routine use of intra-abdominal drains, and active warming according to operator preference.

**Post-operative measures**

**Fast track**

Removal of nasogastric tube and urinary catheter within 24 hours, early mobilization within 12 hours, clear fluids resumption within 24 hours, soft diet resumption within 48 hours, and solid diet resumption within 72 hours, strict fluid management post operatively and early discontinuation of intravenous fluids with resumption of oral feeds, early removal of abdominal drains, post-operative nausea and vomiting prophylaxis, opioid sparing multimodal analgesia, and early discharge after the patient is accepting solid diet.

**Convectional**

Retaining the nasogastric tube till the patient passes flatus, and removal of urinary catheters according to surgeon preference, mobilization within 24 hours, feeding. Clear fluids, soft and solid diet resumption after bowel motion, fluids management according to surgeon's preference, removal of abdominal drains according to surgeon preference, nausea and vomiting prophylaxis, perioperative use of opioids and discharge once they had passed faeces.

**Follow up during the period of the study up to 30 days**

Readmission, reoperation and mortality rates up to 30 days post-operatively.

**Results**

There were no significant differences between both groups regarding demographic data (Age and gender), comorbidities, type of presenting pathology (Obstructed hernia, complicated appendicitis, perforated peptic ulcer, adhesive intestinal obstruction, and left sided large bowel obstruction). Table 1

**Table 1:** Comparison between both groups regarding demographic data, comorbidities, other previous surgeries, and type of presenting pathology

| | | Group I (n= 37) | | Group II (n = 37) | | P value |
|---|---|---|---|---|---|---|
| Age (years) | Mean±SD. | 50.27±13.13 | | 50.11±13.18 | | 0.888 |
| | Median (IQR) | 54.0 (45.0 – 60.0) | | 50.0 (40.0 – 60.0) | | |
| Gender | Male | 25 | 67.6% | 23% | 62.1 | 1.000 |
| | Female | 12 | 32.4% | 14% | 37.8 | |
| **Comorbidities** | | | | | | |
| DM | | 7 | 18.9 | 7 | 18.9 | 1.000 |
| HTN | | 11 | 29.7 | 11 | 29.7 | 1.000 |
| Cardiac | | 5 | 13.5 | 6 | 16.2 | 0.744 |
| Hepatic | | 5 | 13.5 | 7 | 18.9 | 0.528 |
| Asthma | | 6 | 16.2 | 4 | 10.8 | 0.496 |
| Neurological insult | | 1 | 2.7 | 0 | 0.0 | 1.000 |
| **Type of presenting pathology** | | | | | | |
| Abdominal hernia | | 15 | 40.5 | 11 | 29.7 | 0.330 |
| Hepatic focal lesions | | 6 | 16.2 | 8 | 21.6 | 0.553 |
| Adhesiolysis | | 4 | 10.8 | 4 | 10.8 | 1.000 |
| Cancer colon | | 0 | 0.0 | 3 | 8.1 | 0.240 |
| Spleenectomy | | 3 | 8.1 | 4 | 10.8 | 1.000 |
| Mesenteric cyst | | 1 | 2.7 | 2 | 5.4 | 1.000 |
| Roux en y gastro-jejunostomy | | 2 | 5.4 | 0 | 0.0 | 0.493 |
| Distal gastrectomy | | 4 | 10.8 | 3 | 8.1 | 1.000 |
| Superior mesenteric artery syndrome | | 2 | 5.4 | 0 | 0.0 | 0.493 |
| Distal pancreatectomy | | 0 | 0.0 | 2 | 5.4 | 0.493 |

Data are presented as mean±SD, median (IQR), or number (%). IQR: Interquartile range, DM: diabetes mellites, HTN: hypertension, GIT: gastrointestinal tract.

A statistically significant higher usage was found in group I compared to group II regarding multi modal analgesia, Intra operative warming, epidural analgesia and less insertion of Naso gastric tube ($p$<0.001), while insignificant difference was found between both groups regarding DVT prophylaxis, and Ryle reinsertion. Patients in fast-track group were encouraged to mobilize early within the first 12 hours and that was significant. Table 2.

**Table 2:** Comparison between both groups regarding pre- operative, intra operative, and to post- operative measures

| | | Group I (n= 37) | | Group II (n = 37) | | P value |
|---|---|---|---|---|---|---|
| | | No. | % | No. | % | |
| **Pre-operative measures** | | | | | | |
| Detailed counseling | | 37 | 100.0 | 24 | 64.9 | 0.7 |
| Naso gastric tube insertion | | 6 | 16.2 | 14 | 37.8 | <0.001* |
| Multi modal analgesia | | 37 | 100.0 | 6 | 16.2 | <0.001* |
| VTE risk assessment | | 37 | 100.0 | 37 | 100.0 | 1.000 |
| **Intra operative measures** | | | | | | |
| Antibiotics | | 37 | 100.0 | 37 | 100.0 | 1.000 |
| Epidural analgesia | | 37 | 100.0 | 6 | 16.2 | 0.001 |
| **Post-operative measures** | | | | | | |
| PONV reduction | | 37 | 100.0 | 37 | 100.0 | 1.000 |
| DVT prophylaxis | | 15 | 40.5 | 16 | 43.2 | 0.814 |
| Chest physiotherapy | | 37 | 100.0 | 30 | 81 | 0.900 |
| Ryle reinsertion | | 2 | 5.4 | 2 | 5.4 | 1.000 |
| Mobility | Within 12 hrs. | 37 | 100.0 | 0 | 0.0 | 0.001 |
| | Within 1 day | 0 | 0.0 | 37 | 100.0 | |
| | Within 1.5 day | 0 | 0.0 | 0 | 0.0 | |
| | Within 2 days | 0 | 0.0 | 0 | 0.0 | |

Data are presented as number (%). VTE: venous thromboembolism, GDHT: goal directed hemodynamic therapy, PONV: post-operative nausea and vomiting, DVT: deep vein thrombosis *: significant as P value < 0.05.

Lower pain analogue score, and earlier drain removal, were significant in group I than group II ($p$<0.05). Post-operative feeding resumption, and hospital stays were earlier in fast track group but no statistically significance was found. Table 3.

**Table 3:** Comparison between both groups regarding nasogastric tube and foley's catheter removal and time to start post- operative feeding, first bowel motion, to pain analogue score, drain removal and hospital stay

| | | Group I (n= 37) | | Group II (n = 37) | | |
|---|---|---|---|---|---|---|
| | | No. | % | No. | % | |
| **Time to start post-operative feeding** | | | | | | |
| Fluids (days) | Mean±SD. | 0.73±0.27 | | 0.94±0.64 | | 0.133 |
| | Median (IQR) | 0.50 (0.50 – 1.0) | | 1 (0.5 – 1.0) | | |
| Soft diet (days) | Mean±SD. | 1.68±0.79 | | 1.92±1.08 | | 0.427 |
| | Median (IQR) | 1.50 (1.0 – 2.0) | | 2.0 (1.0 – 2.0) | | |
| **Pain analoge score** | | | | | | |
| Pain analoge score | Mean±SD. | 3.08±0.76 | | 4.78±1.13 | | <0.001* |
| | Median (IQR) | 3.0 (3.0 – 4.0) | | 5.0 (4.0 – 6.0) | | |
| Drain removal (days) | Mean±SD. | 3.08±0.83 | | 5.14±0.95 | | <0.001* |
| | Median (IQR) | 3.0 (2.0 – 4.0) | | 5.0 (4.0 – 6.0) | | |
| Hospital stays | Mean±SD. | 3.69±1.52 | | 3.99±1.65 | | 0.466 |
| | Median (IQR) | 4.0 (2.0 – 5.0) | | 5.0 (4.0 –6.0) | | |

Data are presented as mean±SD or median (IQR). IQR: Interquartile range. *: significant as P value < 0.05

There was no significant difference between the two groups regarding postoperative nausea and vomiting, paralytic ileus, pulmonary complications, surgical site infection, mortality and re-admission rates. Table 4.

**Table 4:** Comparison between both groups regarding post- operative complications and secondary outcomes

| | Group I (n= 37) | | Group II (n = 37) | | |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| **Post-operative complications** | | | | | |
| PONV | 6 | 16.2 | 7 | 18.9 | 0.760 |
| Paralytic ileus | 2 | 5.4 | 3 | 8.1 | 1.000 |
| SSI | 7 | 18.9 | 5 | 13.50 | 0.398 |
| Mortality | 0 | 0.0 | 0 | 0.0 | – |
| Re admission | 2 | 5.4 | 3 | 8.1 | 0.643 |

Data are presented as number (%). PONV: post-operative nausea and vomiting. *: significant as P value < 0.05

## Discussion

A multimodal perioperative care pathway known as fast-tracks protocols. The primary objective of fast track is to decrease the surgical stress response, thus promoting faster postoperative recovery, early feeding resumption, shorter hospital stays without increase in post-operative complications [5].

The mean age of patients in participating in fast-track group was 50.27±(13.13) while it was 50.11±(13.18) in conventional group with no statistically significant difference. There were 25 males (67.6%) and 12 females (32.4%) in both groups. That was similar to Anderson, A., *et al*, in which the mean age in optimized group was 64 years compared to conventional group which was 68 years old [6].

There was a significant difference between the two groups regarding detailed counseling, multi-modal analgesia, and number of patients who had nasogastric tube insertion. All patients in group I had pre-operative detailed counseling, multimodal analgesia, and 6 patients had Ryle insertion while in group II, 24 patients (64.9%) had detailed counseling, 6 patients (16.2%) had multimodal analgesia, 15 patients (40.5%) with strict 6 hours fasting and 14 patients had Ryle insertion with p value less than 0.001. That was consistent with Delaney, C. P., *et al*. in their study on patients needed laparotomy for intestinal resection [7].

The mean of fluids resumption was 0.73±0.27 days, soft diet

resumption was 1.68±0.79 days in fast-track group while in conventional group, the average of fluids resumption was 0.94±0.64 days, soft diet resumption was 1.92±1.08 days. These results were comparable with McAlee, A. and J. J. C. C. N. Q. Allred (2021) in which early oral feeding lead to rapid recovery and decrease paralytic ileus without significant increase in post operative complications [8].

There was a significant lower pain score in the fast-track group with early removal of the abdominal drain. The mean of abdominal drain removal was 3.08±0.83 in group I while it was 5.14±0.95 in group II which was statistically significant. The average pain score was 3.08±0.76 in the Fast track group compared to conventional group which was 4.78±1.13 with p value = 0.001 which was significant. In contrast, Chemali, M. E. and G. D. Eslick (2017), in their study on patients undergoing colorectal surgery, there was no difference regarding pain scales post operatively or time to remove abdominal drain [9].

The average of hospital stay was 3.69±1.52 days in ERAS group while in conventional group was 3.99±1.65 days without significant difference. In Visioni, A., *et al*. in their study there was significant difference regarding reduction of hospital stay, and time to have first bowel motion with p value ⩽0.05 [10].

We had 6 cases (16.2%) with PONV, 2 cases (5.4%) with paralytic ileus, and 7 cases (18.9%) with SSI in fast track group compared to conventional group which had 7 cases (18.9%) with PONV, 3 cases (8.1%) with paralytic ileus, and 5 cases (13.5%) with SSI without significant difference between both groups. In Slim and Theissen, in their study on 156 patients undergoing different abdominal surgeries in elective settings, there were statistically significant difference between ERAS group and conventional care group regarding length of hospital stay and post-operative complications with p value less than 0.05 [11].

## Conclusions

ERAS protocols are effective and have beneficial outcomes in elective settings.

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**Conflict of Interest:** Nil

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