Current concept and evolution of Enhanced Recovery After Surgery (ERAS)

Kyung Sik Kim

Hepatobiliary Pancreatic Surgery
Dept. of Surgery, Severance Hospital
Yonsei University College of Medicine, Seoul, Korea
Contents

- What is the ERAS?
- Main goal of ERAS
- Is ERAS needed?
- Main elements of ERAS
- ERAS in HBP surgery
- Severance Experience
- Summary
What is the ERAS

- Aiming to streamline perioperative care pathways to maximize effectiveness and minimize costs.

Sir David Cuthbertson (1900-1986)
The generic term of ‘enhanced recovery’ is centrally concerned with helping patients to get better sooner following surgery by minimizing the physical assault on the body and seeking to decrease the human physiological stress response.
Main goal of ERAS

- reduction of the metabolic stress to surgery will allow the patient to recovery faster.
ERAS is needed?
진영 내정자, DRG 확대 필요...의사 증원은 유보적

"진영 내정자, DRG 확대 필요...의사 증원은 유보적"

사면단에서 둘러싼 봉철을 뒤집은 내정자 인사정책

"전문가적 효율화 위해 관계자들이 편리한 수요网页 필요로 한다."

보건복지부 내정자 가로 사진

보건복지부 장관 내정자

진영 보건복지부 장관 내정자

진영 보건복지부 장관 내정자가 포괄화가 적었다. 의사 수 증원에 대해서는 전체적 접근성을 높여야 할 방안을 마련하고 있다. 진 내정자가 6일 인사상황을 알리며 정의에 의한 발언을 했다.

"가장 먼저 2월 OECD가 `한국 의료 포괄화'를 확대하고 적정한 입생공정을 강화할 필요가 있다."

중병 DRG 확대, 사전 작업 한창

"중병, 중합병원 특소결과가 전국 학회 의견 연구 수행중"

"중병, 중합병원 특소결과가 전국 학회 의견 연구 수행중"

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"중병, 중합병원 특소결과가 전국 학회 의견 연구 수행중"
Six randomized controlled trials with 452 patients were included.

The number of individual ERAS elements used ranged from 4 to 12, with a mean of 9.

The length of hospital stay [weighted mean difference (95% confidence interval): 2.55 (3.24, 1.85)] and complication rates [relative risk (95% confidence interval): 0.53 (0.44, 0.64)] were significantly reduced in the enhanced recovery group.

There was no statistically significant difference in readmission and mortality rates.
Main Elements of ERAS
Main elements of ERAS protocols

- Pre-admission counselling
- No bowel prep
- Fluid and CHO - loading/no fasting
- No premed
- No NG tubes
- Mid-thoracic epidural anaesthesia/analgesia
- Short-acting anaesthetic agent
- Warm air body heating in theatre
- Short incisions, no drains
- Avoidance of sodium/fluid overload
- Prevention of nausea and vomiting
- Non-opiate oral analgesics/NSAIDs
- Routine mobilisation care pathway
- Stimulation of gut motility
- Early removal of catheters
- Perioperative oral nutrition
- Audit of compliance/outcomes
A crucial aspect for enhanced recovery is good quality patient information.
ERAS in HBP surgery
Day before surgery
- Normal feeding until midnight
- No preanaesthetic medication

Day of surgery
- Mid-thoracic epidural analgesia (local anaesthetic and low-dose opioid)
- Short-acting anaesthetic agent
- No nasogastric tube (removed immediately after surgery, if used)
- Warm intravenous fluids and body warming device
- Avoidance of excessive intravenous fluids
- No routine drainage of peritoneal cavity
- Free oral intake of water/nutrition started immediately
- Patient out of bed for 2 h

Day 1 after surgery
- Patient mobilized
- Intravenous fluids discontinued
- Patient to drink at least 1 litre of fluid
- Normal diet
- Continue mid-thoracic epidural analgesia
- Paracetamol 1 g four times daily

Day 2 after surgery
- Continue mid-thoracic epidural analgesia
- Paracetamol 1 g four times daily
- Normal diet
- Patient mobilized

Day 3 after surgery
- Stop epidural
- Commence NSAIDs if appropriate
- Remove urinary catheter
- Encourage full oral intake and mobilization
- Review discharge criteria

Day 4 after surgery
- Encourage full oral intake and mobilization
- Review discharge criteria

Methods: Seventy-four patients undergoing liver resection were randomized in a two-by-two factorial design to receive either postoperative magnesium hydroxide as a laxative, preoperative carbohydrate loading and postoperative ONS, their combination or a control group. Patients were managed within an ERAS programme of care. The primary outcome measure was time to first passage of stool. Secondary outcome measures were gastric emptying, postoperative oral calorie intake, time to functional recovery and length of hospital stay.

Results: Sixty-eight patients completed the trial. The laxative group had a significantly reduced time to passage of stool: median (interquartile range) 4 (3–5) versus 5 (4–6) days (P = 0.034). The ONS group showed a trend towards a shorter time to passage of stool (P = 0.076) but there was no evidence of interaction in patients randomized to the combination regimen. Median length of hospital stay was 6 (4–7) days. There were no differences in secondary outcomes between groups.

Conclusion: Within an ERAS protocol for patients undergoing liver resection, routine postoperative laxatives result in an earlier first passage of stool but the overall rate of recovery is unaltered.
High evidence & strong recommendation grade

- Anti thrombotic prophylaxis
- Antimicrobial prophylaxis and skin preparation
- Avoiding hypothermia
- Perianastomotic drain
- Urinary drainage
Anti-thrombotic prophylaxis

- LMWH reduces the risk of thromboembolic complications, and administration should be continued for 4 weeks after hospital discharge.
- Concomitant use of epidural analgesia necessitates close adherence to safety guidelines.
- Mechanical measures should probably be added for patients at high risk.
Antimicrobial prophylaxis and skin preparation

- Antimicrobial prophylaxis prevents surgical-site infections, and should be used in a single-dose manner initiated 30 -60 min before skin incision.

- Repeated intraoperative doses may be necessary depending on the half-life of the drug and duration of procedure.
Avoiding hypothermia

- Intraoperative hypothermia should be avoided by using cutaneous warming, i.e., forced-air or circulating-water garment systems.
Early removal of drains after 72 h may be advisable in patients at low risk (i.e., amylase content in drain <5000 U/L) for developing a pancreatic fistula.

There is insufficient evidence to recommend routine use of drains, but their use is based only on low-level evidence.
Transurethral catheters can be removed safely on postoperative day 1 or 2 unless otherwise indicated.
A MEDLINE® literature search was undertaken using the keywords ‘enhanced recovery’, ‘fast-track’, ‘peri-operative’, ‘surgery’, ‘pancreas’ and ‘liver’ and their derivatives such as ‘pancreatic’ or ‘hepatic’.

The primary endpoint was length of postoperative hospital stay.

Secondary endpoints were morbidity, mortality and readmission rate.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Surgery (liver / pancreas)</th>
<th>Study design</th>
<th>Surgery type (ERP cohort where applicable)</th>
<th>Patients in ERP</th>
<th>Significant study findings compared with historical control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berberat et al</td>
<td>2007</td>
<td>Pancreas</td>
<td>Prospective historical comparison study</td>
<td>Pancreatic head resection 70.6%; distal 20%; total 5.9%; segmental 3.5%</td>
<td>255</td>
<td>More rapid time to passing first stool (5 vs 6 days, (p&lt;0.001)); shorter length of stay (13 vs 15 days, (p&lt;0.001)); less morbidity (47.2% vs 58.7%, (p=0.014)) with no difference in readmission rate (7.1% vs 6.3%, (p=0.865))</td>
</tr>
<tr>
<td>Balzano et al</td>
<td>2008</td>
<td>Pancreas</td>
<td>Prospective historical comparison study</td>
<td>PD</td>
<td>252</td>
<td></td>
</tr>
<tr>
<td>van Dam et al</td>
<td>2008</td>
<td>Liver</td>
<td>Prospective case series comparing with a historical control</td>
<td>Hemihepatectomy 33%; hemihepatectomy + metastasectomy 10%; extended hemihepatectomy 11%; multisegmental 28%; central resection 2%; metasectomy 16%; repeat hepatectomy 11%</td>
<td>61</td>
<td>Reduced length of stay (6 vs 8 days, (p&lt;0.001)); no significant difference in morbidity (41% vs 31%, (p=0.197)) or readmission rate (13% vs 10%, (p=0.61))</td>
</tr>
<tr>
<td>MacKay et al</td>
<td>2008</td>
<td>Liver</td>
<td>Prospective case series</td>
<td>1 lobectomy; 2 trisegmentectomy; 3 bisegmentectomy; 6 segment</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Stoot et al</td>
<td>2009</td>
<td>Liver</td>
<td>Prospective multicentre comparison study</td>
<td>Laparoscopic lateral resection, 1 segment IV</td>
<td>13</td>
<td>No significant reductions in length of stay (5 vs 7 days, (p=0.305)) or morbidity/mortality; significantly less intra-operative blood loss (50ml vs 250ml, (p=0.002))</td>
</tr>
<tr>
<td>Koea et al</td>
<td>2009</td>
<td>Liver</td>
<td>Consecutive patients in an ERP comparing analgesia with single dose intrathecal morphine with gabapentin or continuous epidural analgesia</td>
<td>Hemihepatectomy 36%; extended hepatectomy 4%; multisegmentectomy 18%; monosegmentectomy 5%; metastasectomy 22%</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Hendry et al</td>
<td>2010</td>
<td>Liver</td>
<td>Randomised controlled trial of laxatives and oral nutrition supplements within an ERP</td>
<td>Major resection 77.9%; minor resection 22.1%</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Montiel Cesado et al</td>
<td>2010</td>
<td>Pancreas</td>
<td>Retrospective historical comparison study</td>
<td>Classic PD</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>di Sebastiano et al</td>
<td>2011</td>
<td>Pancreas</td>
<td>Prospective historical comparison study</td>
<td>Pylorus preserving PD 62.1%; PD 2.7%; duodenum preserving pancreatic head resection 2.7%; distal pancreatectomy 13.8%; central pancreatectomy 2.1%; total pancreatectomy 6.9%; completion pancreatectomy 1.4%; other 8.3%</td>
<td>145</td>
<td>Reduced length of stay (7 vs 11 days, (p&lt;0.01)); no difference in morbidity (37.7% vs 37.5%, (p=0.982)), mortality (1.8% vs 1.6%, (p=0.706)) or readmission rate (7.1% vs 3.3%, (p=0.424))</td>
</tr>
<tr>
<td>Lin et al</td>
<td>2011</td>
<td>Liver</td>
<td>Prospective comparison study at same site before and after introduction of ERP</td>
<td>Bisegmentectomy 30.4%; segmentectomy 23.2%; hemihepatectomy 16.1%; non-anatomical resection 12.5%; central resection 10.7%; extended hemihepatectomy 7.1%</td>
<td>61</td>
<td></td>
</tr>
</tbody>
</table>
## Liver resectional surgery

<table>
<thead>
<tr>
<th></th>
<th>van Dam et al(^8)</th>
<th>MacKay et al(^9)</th>
<th>Stoot et al(^0)</th>
<th>Koea et al(^1)</th>
<th>Hendry et al(^2)</th>
<th>Lin et al(^5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-operatively</strong></td>
<td>Oral nutrition until midnight; no premedication</td>
<td>Information given to patient about fast track rehabilitation</td>
<td>Information given to patient; no premedication; carbohydrate drink until 2h pre-operatively</td>
<td>Nil by mouth for 4h pre-operatively</td>
<td>Oral nutrition until midnight; no premedication</td>
<td>Information given to patient; no premedication or bowel preparation</td>
</tr>
<tr>
<td><strong>Day 0</strong></td>
<td>Thoracic epidural; remove NG post-operatively; no routine drains; oral fluids post-operatively; CVP &lt;5mmHg</td>
<td>Oral fluids until 2h pre-operatively; no routine use of drains; oral fluids and supplementary drinks; PCA</td>
<td>Thoracic epidural catheter; no routine NG tube; oral liquid diet 6h post-operatively; laxatives and prokinetics; CVP &lt;5mmHg</td>
<td>No routine use of NG tubes or surgical drains; liquid/light diet on waking</td>
<td>Thoracic epidural catheter; no routine drains; free clear fluids post-operatively; out of bed for 2h</td>
<td>Thoracic epidural catheter; no routine drains or NG tube; oral liquid diet 6h post-operatively</td>
</tr>
<tr>
<td><strong>Day 1</strong></td>
<td>Mobilise; IV fluids stopped; normal diet; paracetamol and magnesium oxide</td>
<td>Diet if tolerated; small Gelofusine® boluses if hypovolaemic (stopped after 24h)</td>
<td>Mobilise; IV fluids stopped; normal diet; paracetamol and magnesium oxide</td>
<td>Remove arterial line and catheter; unrestricted diet; mobilise; routine blood tests</td>
<td>Mobilise; IV fluids stopped; normal diet; paracetamol</td>
<td>Mobilise &gt;2h; reduce IV fluids; 1L liquid diet; catheter out</td>
</tr>
<tr>
<td><strong>Day 2</strong></td>
<td>As above</td>
<td>Remove PCA; step-down analgesia; remove catheter; mobilise</td>
<td>As above</td>
<td>Mobilise; continue diet; repeat blood tests</td>
<td>As above</td>
<td>Mobilise four times daily; epidural removed; NSAIDs</td>
</tr>
<tr>
<td><strong>Day 3</strong></td>
<td>Stop epidural; start NSAIDs; remove catheter; full oral intake</td>
<td>Mobilise; continue diet; repeat blood tests</td>
<td>Stop epidural; start NSAIDs; remove catheter; full oral intake</td>
<td>As above; first surgical dressing change</td>
<td>Stop epidural; start NSAIDs; remove catheter; full oral intake</td>
<td>Mobilise four times daily &lt;6h; 2L light diet</td>
</tr>
<tr>
<td><strong>Day 4</strong></td>
<td>Review discharge criteria</td>
<td>Review discharge criteria</td>
<td>Review discharge criteria</td>
<td>Review discharge criteria</td>
<td>Oral medication; stop IV fluids; mobilise &gt;6h</td>
<td></td>
</tr>
<tr>
<td><strong>Day 5</strong></td>
<td>Discharged if pain control with oral analgesics and solid foods; adequate mobilisation</td>
<td>Discharge when normal or decreasing bilirubin, good pain control, normal diet tolerated and mobilising to pre-operative level</td>
<td></td>
<td>Check blood tests; remove central venous line; discharge</td>
<td>Normal diet; give discharge instructions; mobilise four times daily &gt;6h</td>
<td>Discharge on day 6 when fully mobile, pain control adequate and normal organ function; follow-up in outpatients clinic on days 10, 15 and 30</td>
</tr>
<tr>
<td></td>
<td>Berberat et al&lt;sup&gt;16&lt;/sup&gt;</td>
<td>Balzano et al&lt;sup&gt;17&lt;/sup&gt;</td>
<td>Montiel Casado et al&lt;sup&gt;23&lt;/sup&gt;</td>
<td>di Sebastiano et al&lt;sup&gt;24&lt;/sup&gt;</td>
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<tr>
<td><strong>Pre-operatively</strong></td>
<td>Information given to patient about fast track rehabilitation</td>
<td>Information given to patient; LMWH</td>
<td>Analgesia by elastomeric pump&lt;sup&gt;*&lt;/sup&gt;; remove NG tube on extubation; warm IV fluids; ICU stay; CVP &lt; 5 mmHg</td>
<td>Oral nutrition until 10pm; no premedication</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 0</strong></td>
<td>LMWH; octreotide; NG tube and drains used routinely; ICU stay; epidural or PCA</td>
<td>Thoracic epidural (T7-9; bupivacaine 0.125% and fentanyl 2 μg/ml) plus IV paracetamol and NSAIDs</td>
<td>Epidural analgesia; removal of NG tube after surgery; ICU stay; liquids; prokinetic and octreotide</td>
<td>Move to ward; mobilise four times daily; clear oral fluids within 4 h post-operatively; metoclopramide and paracetamol</td>
<td></td>
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<tr>
<td><strong>Day 1</strong></td>
<td>Metoclopramide, lactulose and magnesium until first stool; oral fluids within 6 h post-operatively</td>
<td>Remove NG tube if draining &lt; 300 ml; mobilise out of bed; IV fluids until adequate oral intake</td>
<td>Move to ward; moving patient to chair; inhalation; liquid diet</td>
<td>Move to ward; mobilise four times daily; clear oral fluids within 4 h post-operatively; metoclopramide and paracetamol</td>
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</tr>
<tr>
<td><strong>Day 2</strong></td>
<td>Stepwise reduction in analgesia to non-opioids</td>
<td>Enhanced mobilisation (&gt;2 h out of bed)</td>
<td>Light diet; continue as per day 1</td>
<td></td>
<td></td>
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<tr>
<td><strong>Day 3</strong></td>
<td>Removal of drains between days 1 and 3; gradual increase in diet</td>
<td>Enhanced mobilisation (&gt;4 h out of bed); clear free fluids</td>
<td>Remove epidural; semiliquid diet; remove Foley catheter</td>
<td>Stop elastomeric pump; start NSAIDs; remove catheter; soft diet</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 4</strong></td>
<td>Solid food intake</td>
<td>Soft diet</td>
<td>Normal diet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 5</strong></td>
<td>Diet increased daily until 1,000 kcal on day 8; remove drain (if &lt; 200 ml); remove epidural</td>
<td>Discharged if no fever, pain control with oral analgesics, solid foods &gt; 1,000 kcal/day; adequate mobilisation and willingness for discharge</td>
<td>Discharge if no fever; good pain control and tolerance of oral analgesics</td>
<td>Plan for discharge on day 7 if pain control with oral analgesics, no nausea, solid food; adequate mobilisation and willingness for discharge</td>
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</tr>
</tbody>
</table>
Enhanced recovery programmes in hepatobiliary and pancreatic surgery: a systematic review

TC Hall, AR Dennison, DK Bilku, MS Metcalfe, G Garcea

University Hospitals of Leicester NHS Trust, UK

**CONCLUSIONS**

- The introduction of an ERP in HPB surgery appears safe and feasible.
- Currently, many of the principles of the multimodal pathway are derived from the colorectal ERP and distinct differences exist, which may impede its implementation in HPB surgery.
Severance Hospital Experiences
Well-defined responsibilities

- Content from the image is not directly translatable into natural text without a more precise context or additional information. The diagram seems to outline roles and responsibilities in a medical or healthcare setting, possibly involving coordination among different medical professionals.

- Further details and specific roles would require a more detailed interpretation of the visual content or additional textual information that is not provided in the image.
The significance of Critical Pathway in Laparoscopic Cholecystectomy

**Gender and Age Distribution**

<table>
<thead>
<tr>
<th></th>
<th>CP applied group (70)</th>
<th>Non-CP applied group (106)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex ratio M/F</td>
<td>34/36</td>
<td>16/90</td>
</tr>
<tr>
<td>Mean Age (years)</td>
<td>40.5</td>
<td>39.8</td>
</tr>
</tbody>
</table>

**Flowchart**

- **3 days 2 nights**
  - OP Permission, Premedication
    - Skin test, MN, NPO
  - Admission
  - op
  - Discharge
  - Pre OP iv line start, Post OP Care

- **2 days 1 nights**
  - OPD
    - Op permission, Premedication, Explain of NPO
  - Admission & OP
  - Discharge
  - OPD
    - Confirm of OP Permission, Anesthesia Permission, Premedication, NPO
    - Skin Test, Pre op iv line start, Post OP Care
  - Discharge Education and Discharge
복강절 1급 2급 담당검수 설문지

1. 수술전일 수술에 필요한 준비를 하는데 어려움이 있었습니까?
   □ 전혀 없었습니다 □ 그저 그렇습니다 □ 꽤 모로졌습니다 □ 많았습니다 □ 매우 많았습니다
2. 수술 당일 내복에 입을 수술을 하는데 불편은 있었습니다か?
   □ 전혀 없었습니다 □ 그저 그렇습니다 □ 꽤 모로졌습니다 □ 많았습니다 □ 매우 많았습니다
   2-1. 불편한 점은 무엇인가요?

( )

8. 의료진이 수술이 필요한 이유와 수술 처방, 다음 �工程施工에 대해 수술 전에 설명해 준 은 어려웠습니까?
   □ 매우 미흡하나 □ 미흡하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
4. 수술 후 생길 수 있는 결과가 완전히 설명된 상황으로 이해하기 위해 전심 호흡, 기침, 운동 등에 대해 수술 전에 설명해 준 내용에 대해 만족하셨습니까?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
5. 통증을 완화시키기 위한 의료진의 적절한 교육을 제공하는 부분에 대해서 만족하셨습니까?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
6. 당일에 대한 의사의 해석에 대해 만족하셨습니까?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
7. 당일에 대한 간호사의 해석에 대해 만족하셨습니까?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
8. 수술 결과에 만족하고 계셨습니까?
   □ 만족하나
   □ 수술 전보다 낫다 □ 변화 없나 □ 악화되었다
9. 수술 전 낮 기대감을 10점으로 하여 수술 후 만족도는 어떠셨습니까?
   수술시간 ( ) 수술시간 ( ) 특별히 잘한가 보였습니다 ( ) 최대 발판 ( ) 최악 발판 ( )
10. 수술 전 낮 상태를 10점으로 하여 수술 후 종의 상태는 어떠셨습니까?
   수술시간 ( ) 수술시간 ( ) 특별히 잘한가 보였습니다 ( ) 최대 발판 ( ) 최악 발판 ( )
11. 의료진이 적절하게 안전한 의료를 담당할 수 있도록 하고 잘 들어주었습니다か?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
12. 회복 후 체중, 식이, 임상생활에 대한 설명이 만족하셨습니까?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
13. 회복 후 외래방문, 투약 설명에 대해 만족하셨습니까?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
14. 회복 후 복통, 발열이 있는 경우 최대 후응답으로 오도록 설명해주었습니다가?
   □ 그렇다
   □ 아니라

18. 의료 후 가격은 사회적, 경제적, 기부의, 다른 설명에 대해 만족하셨습니까?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
16. 교육 후 수술과 관련된 건강 상식이 형해진 것에 대해 만족하셨습니까?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
17. 회복 후 가장 걱정되는 것은 무엇이었습니까? (두 문항으로 구분시오)
   □ 않다 □ 통증 �□ 수술후의 교육 복습 필요 □ 일반생활상의 준비부분 □ 의학적적부 �□ 병의 가이드 �□ 기타 ( )
18. 입원 기간은 적당했습니까?
   □ 적 �□ 아니오
19. 1급 2급 개개점수의 입원 생활과 일반 생활에 짧은 도움이 되었습니다가?
   □ 매우 만족하나 □ 만족하나 □ 그저 그렇다 □ 충분하나 □ 매우 충분하나
20. 다음 수술 후가족도 1급 2급 개개점수의 만족도를 추천하시겠습니까?
   □ 네 �□ 아니오

"아니오"면 20-1 여유가 충분했습니다 ( )
20-2 그 이유는 무엇입니까? ( )

수술과의 경험 감사합니다

수상장

위의 부시는 2010년도 세포런스병원 QI 활동계획서에서 "복강절 담당 전산 스팁 CP 개발 및 적용 활용"의 QCI활동을 발표함으로서 의료의 질 향상과 환자만만에 기여할 수 있도록 부상과 함께 이 상장을 드립니다.

2011년 1월 31일

선천제한면 세프로스병원 박용화

수상장
**High risk:** intraoperative cholangiogram, bile spillage, conversion to laparotomy, acute cholecystitis/pancreatitis, jaundice, pregnancy, immunosuppression, insertion of prosthetic devices

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Level</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bile duct surgery</td>
<td>A</td>
<td>Antibiotic prophylaxis is <strong>recommended</strong></td>
</tr>
<tr>
<td>Pancreatic surgery</td>
<td>B</td>
<td>Antibiotic prophylaxis is <strong>recommended</strong></td>
</tr>
<tr>
<td>Liver surgery</td>
<td>B</td>
<td>Antibiotic prophylaxis is <strong>recommended</strong></td>
</tr>
<tr>
<td>Gall bladder surgery (open)</td>
<td>A</td>
<td>Antibiotic prophylaxis is <strong>recommended</strong></td>
</tr>
<tr>
<td>Gall bladder surgery (laparoscopic)</td>
<td>A</td>
<td>Antibiotic prophylaxis is <strong>not recommended</strong></td>
</tr>
<tr>
<td></td>
<td>☑</td>
<td>Antibiotic prophylaxis <strong>should be considered</strong> in high risk* patients</td>
</tr>
</tbody>
</table>
The study included 471 patients undergoing LC between Jan. 2009 through May 2012.

- 279 patients (Group 1) received 2nd generation cephalosporin 1g IV after induction of anesthesia
- 192 patients (Group 2) were not given prophylactic antibiotics.
The role of prophylactic antibiotics in elective LC

Results

- The overall rate of SSI was 1.48% for total 471 patients.
- The incidence of SSI was similar in two groups: ($\chi^2 =0.013 \; ; p=0.910$).
  - 3 of 279 patients (1.56%) in group 1
  - 4 of 192 patients (1.43%) in group 2
- But there was no organ space infection and all of these SSIs were categorized into the only superficial SSIs.
- All of patients occurring SSIs were well treated with conservative treatments without any sequelae.
- Diabetes mellitus ($p=0.021$) and pre-operative albumin level ($p=0.004$) contribute to SSI.

Conclusion

- Prophylactic antibiotics are not necessary for elective LC.
Summary

Preassessment
- Physical fitness
- Anxiety
- Social, cultural and ethnic background

Communication

Information provision
- Psychological support
- Discharge planning
- Post discharge support
Thank You for Your Attention