Regional anaesthesia for laparoscopic surgery

Claudiu Zdrehuş MD, PhD

CEEA Tg Mureș 2016

Surgery

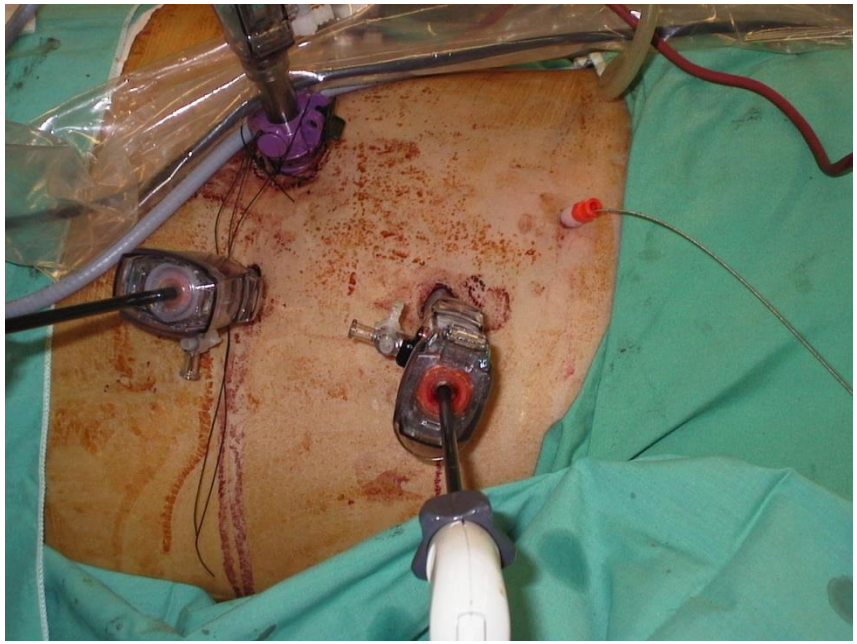
- General surgery
- Minimally invasive surgery
- Non invasive surgery

History

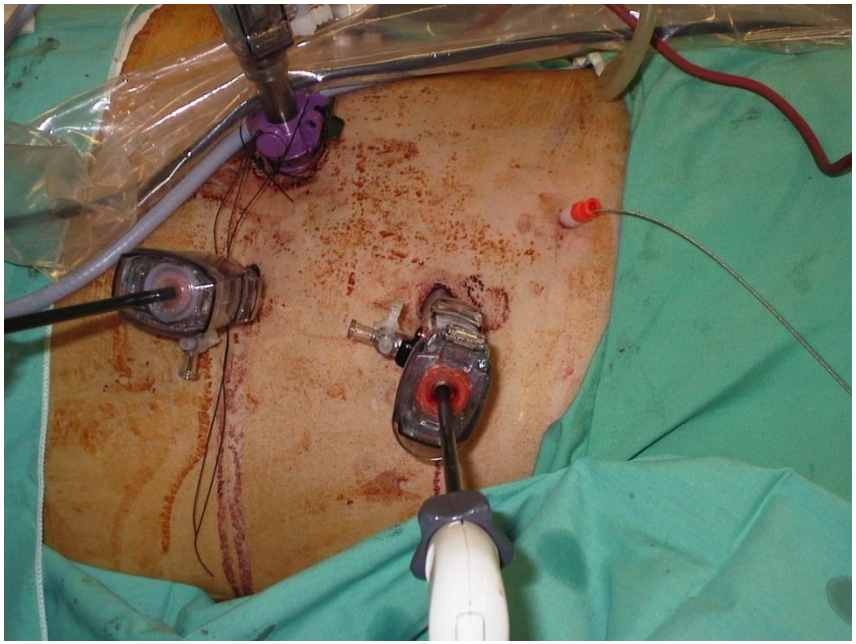
- Gynaecological laparoscopy
- Dangers of peritoneal insufflation of CO2

  "Though laparoscopy offers advantages to both patients and surgeon it involves considerable alteration in respiratory and cardiovascular homeostasis and should not be regarded as yet another minor investigation"

Hodgson, McClelland and Newton 1970



- **De ce chirurgie laparoscopică ?**



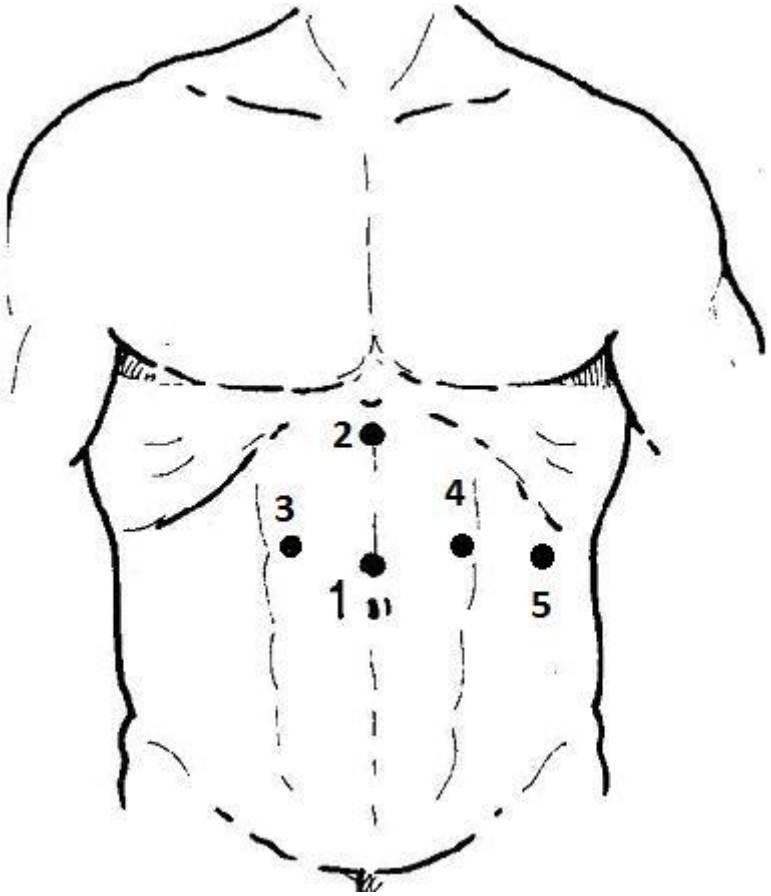
Avantaje

- Acces intraabdominal minim
- Mai puţin traumatică
- Afectare metabolică minimă (niveluri scăzute ale interleukinei 6 și a proteinei C reactive)
- Efecte secundare reduse
- Reluarea precoce a tranzitului intestinal
- Funcție respiratorie postoperatorie mai bună
- Durere postoperatorie redusă
- Durată scurtă de spitalizare
- Reluarea rapidă a activităţilor curente
- Costuri mai reduse

» Barash PG, Cullen BF, Stoelting RK. Clinical Anesthesia 2006: 1061-1071

Chirurgia laparoscopică

- Colecistectomia
- Apendicectomia
- Cura herniei hiatale
- Cura herniei diafragmatice
- Cura herniei inghinale
- Chistul hidatic hepatic
- Splenectomia
- Adrenalectomia (feocromocitom)
- Vagotomia
- Chirurgia pancreasului
- Chirurgia colonului
- Nefrectomia
- Intervenții ginecologice
- Chirurgia obezității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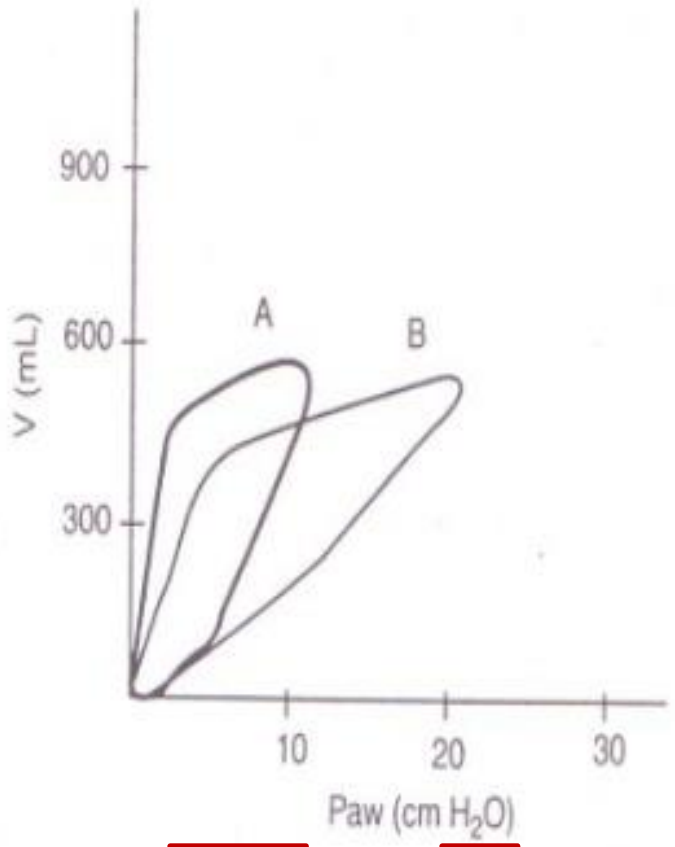
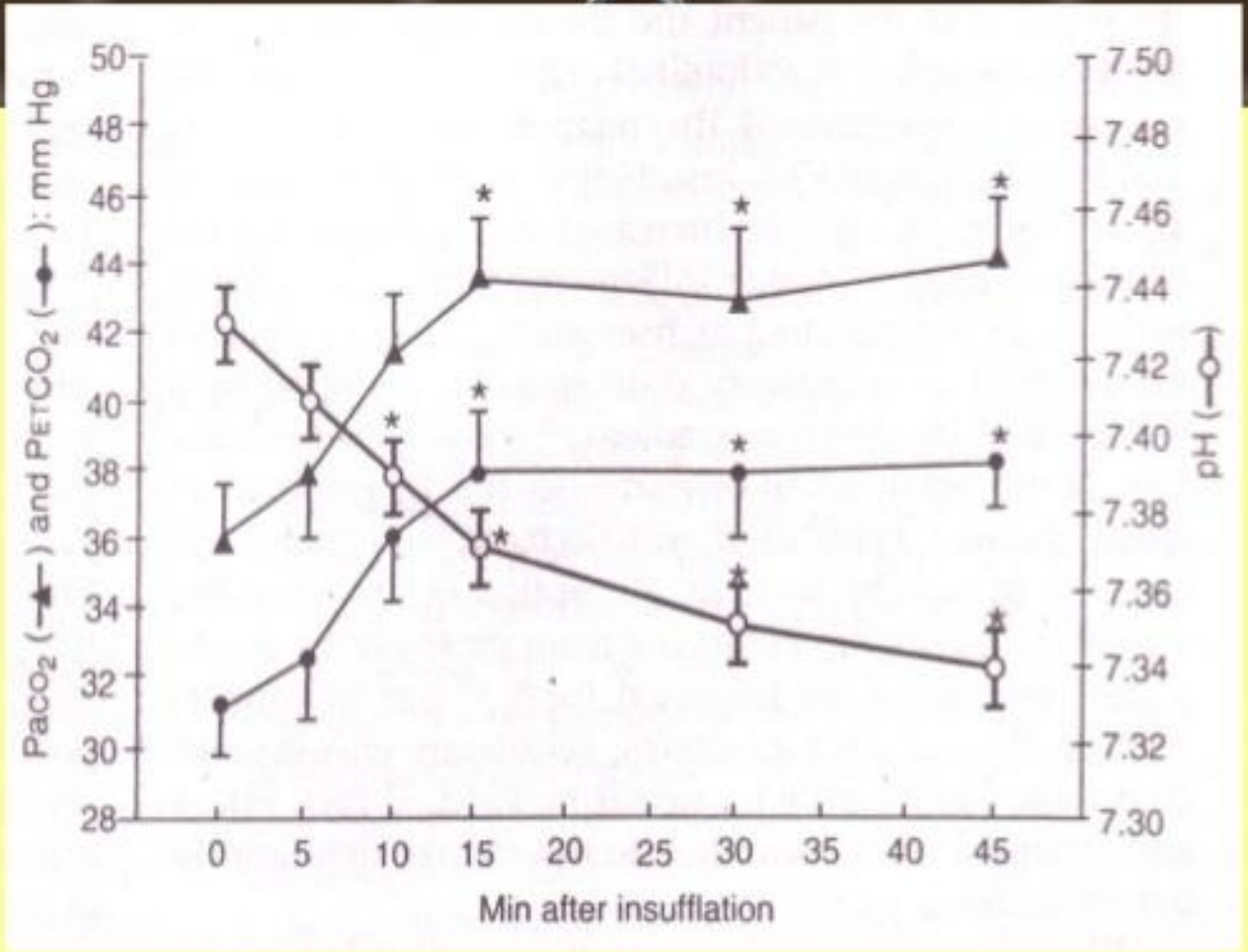
Particularități

- Pneumoperitoneul

- Poziția pacientului pe masa de operație
  - Trendelemburg sau antitrendelemburg



	TV	Ppeak	Pplat	C	$P_{ET}CO_2$
A	522	12	9	56	31
B	525	21	19	27	39



- Changes of PACO2, PETCO2 and PH attain a plateau after 15 to 30 mins after insufflation . Any change there after requires a search for a cause

Conversie

- Hipercapnie > 14 mmHg
- MV scade cu peste 20%
- ASA II, III

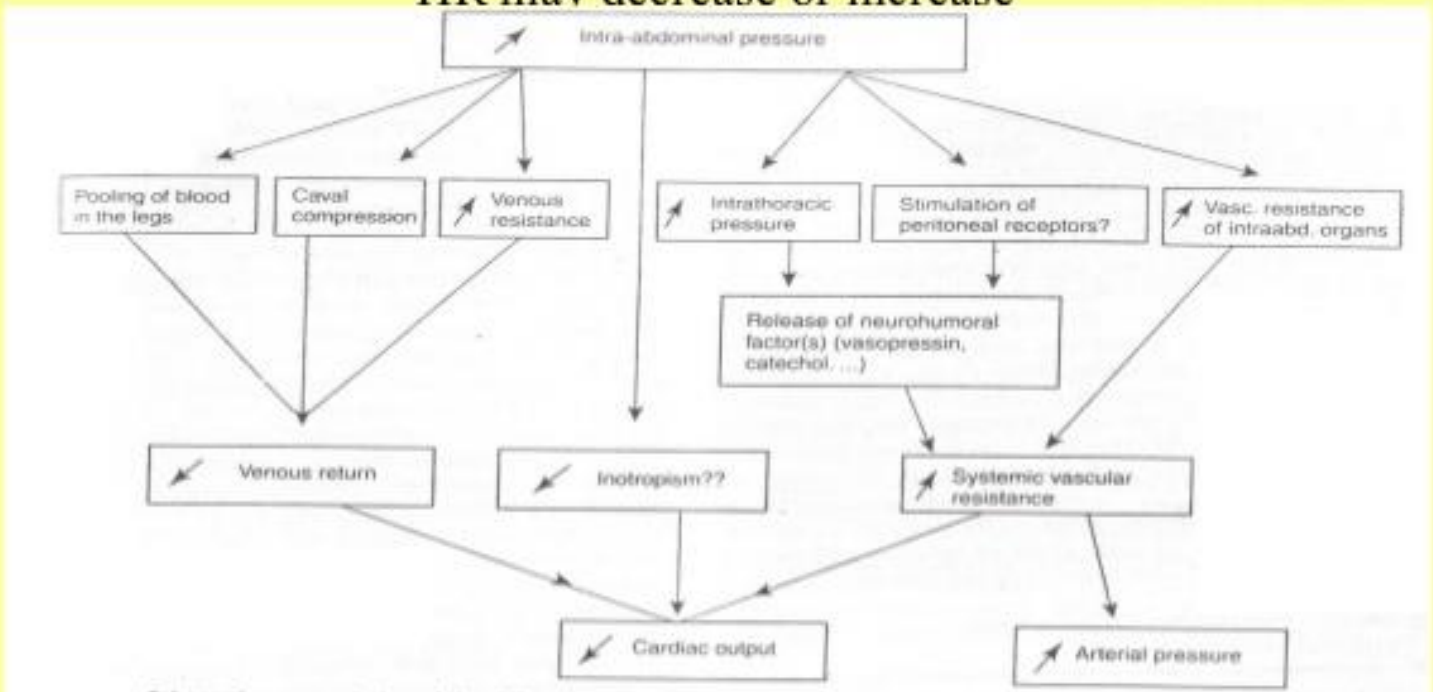
CARDIOVASCULAR CHANGES

These changes are characterized by :

Decreased cardiac output

Elevation of arterial pressure and pulmonary vascular resistance

HR may decrease or increase



Schematic representation of the different mechanisms leading to decreased cardiac output during pneumoperitoneum laparoscopy.

Choice of Anaesthetic Technique For Laparoscopy- The Best One

- With the recent trend towards the use of laparoscopy in day-care surgeries, anaesthetic techniques have changed, with more emphasis on **shorter and more favourable techniques**
- **The ideal anaesthetic technique for laparoscopic surgery should**
  - maintain stable cardiovascular and respiratory functions
  - provide rapid post-operative recovery
  - lead to minimal post-operative nausea and vomiting (PONV)
  - provide good post-operative pain relief for early mobility

Regional anaesthesia (epidural, spinal, CSE)

- **Advantages**
  - Reduction of surgical stress response
  - Prevention of airway instrumentation
  - Provision of effective post-operative analgesia
  - Early ambulation with lower incidence of deep vein thrombosis
  - Less PONV
  - Lower costs
  - There are numerous studies in the literature comparing GA and RA for laparoscopic surgery, which suggests that RA may be a good alternative
    - » Current Evidence S J S Bajwa, A Kulshrestha. JMAC 2016

Regional anaesthesia (epidural, spinal, CSE)

- **Desadvantages**
  - Hypotension due to sympathetic blockade
  - Ventilatory changes due to the higher sensory levels required
  - Occurrence of shoulder-tip pain due to diaphragmatic irritation
  - increased surgical time due to limitation of the intra-abdominal pressure

Laparoscopic cholecystectomy under spinal anesthesia: a pilot study.

Tzovaras G, Fafoulakis F, Pratsas K, Georgopoulou S, Stamatiou G, Hatzitheofilou C.
Department of Surgery, University of Thessaly Medical School, University Hospital of Larissa, Greece
Surg Endosc. 2006 Apr;20(4):580-2

- **METHODS:**
- Fifteen ASA grade I or II patients underwent laparoscopic cholecystectomy with low-pressure CO2 pneumoperitoneum under spinal anesthesia
- **RESULTS:**
- All operations were completed laparoscopically and conversion from spinal to general anesthesia was not required in any of the cases.
- Median pain score 4 h postoperatively was **1.5**, at 8 h it was **1**, and at 24 h it was **1**
- All patients were discharged after 24 h.
- Follow-up 2 weeks postoperatively showed all but one **patient to be satisfied and strongly recommending the anesthetic procedure**
- **CONCLUSION:**
- Laparoscopic cholecystectomy with low-pressure CO2 pneumoperitoneum can be **successfully** and **safely performed under spinal anesthesia**
- Furthermore, it seems that spinal anesthesia is associated with **minimal postoperative pain** and at least an equally good recovery as with general anesthesia.

JSLS Journal of the Society of Laparoendoscopic Surgeons
2008 Apr-Jun; 12(2): 133–138

Laparoscopic Surgery Using Spinal Anesthesia

Rajeev Sinha, MS, FAIS, FICS, A. K. Gurwara, MD, and S. C. Gupta, MD

- Spinal anesthesia is usually preferred in patients where general anesthesia is contraindicated
- Spinal anesthesia was used in **4645 patients in 11 years**
- **Laparoscopic cholecystectomy** was performed in **2992** patients
- There was no modification in the technique, and the intraabdominal pressure was kept at **8 mmHg to 10 mmHg**
- Sedation was given if required, and conversion to general anesthesia was done in patients not responding to sedation or with failure of spinal anesthesia

JSLS Journal of the Society of Laparoendoscopic Surgeons
2008 Apr-Jun; 12(2): 133–138

Rajeev Sinha, MS, FAIS, FICS, A. K. Gurwara, MD, and S. C. Gupta, MD

Advantages

- There is no risk of intubation-related airway obstruction
- little risk of unrecognized hypoglycemia in a diabetic patient
- excellent muscle relaxation
- decreased surgical bed oozing
- more rapid return of gut function when laparoscopic surgery is done using SA compared with GA
- **This is in addition to the obvious advantages in an old patient or those with COPD or other systemic diseases like hepatic and renal disease and diabetes**

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2008 Apr-Jun; 12(2): 133–138

Laparoscopic Surgery Using Spinal Anesthesia

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- Twenty-four (**0.01%)** patients required conversion to general anesthesia.
- Postoperatively, **2.09%** (97) of patients had vomiting compared to **29.22%** (123 patients) of patients who were administered general
- Postural headache persisting for an average of 2.6 days was seen in 255 (**5.4%**) patients postoperatively. Average time to discharge was 2.3 days.
- Karnofsky Performance Status Scale showed a **98.6% satisfaction** level in patients.

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Laparoscopic cholecystectomy under epidural anesthesia: a clinical feasibility study

Ji Hyun Lee,[1] Jin Huh,[3] Duk Kyung Kim,[2] Jea Ryoung Gil,[3] Sung Won Min,[3] and Sun Sook Han[1]

Korean J Anesthesiol. 2010 December; 59(6): 383–388.

- Risk Score for Conversion from Laparoscopic Cholecystectomy to Open Cholecystectomy

	Variables	Coefficients
Sex	Male	11
	Female	0
Abdominal tenderness	Present	9
	Absent	0
Previous upper abdominal operation	Present	8
	Absent	0
Gallbladder wall (ultrasonography)	Thickened	13
	Normal	0
Age (yr)	≥60	5
	<60	0
Acute cholecystitis	Present	15
	Absent	0
Constan		−20

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- **Epidural anesthesia**
- epidural block catheter was placed at the 10th thoracic interspace using a 17 gauge Tuohy needle and a midline approach.
- The anesthetic solution was prepared with 18 ml of lidocaine 2%, plus epinephrine (1 : 200,000) plus 2 ml of sodium bicarbonate 8.4%
- After negative aspiration, 3 ml of the solution was administered as a test dose
- If after 2 minutes there was no evidence of intravascular or subarachnoid injection, an additional 7 ml was injected over a 1.5 minute period with fentanyl 50 μg, and an additional 2 ml of the solution was administered incrementally to reach the desired level of segmental block.
- Intraoperative anxiety was treated with midazolam 1-2 mg, abdominal or referred shoulder pain with incremental fentanyl 1-2 μg/kg, and hypotension with ephedrine 5-10 mg, all as I.V. boluses as required.

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- Questionnaire Form for Patients

1. How was confortable were you during the operation?
   a. Very well
   b. Well
   c. Moderate
   d. Poor
2. Are you happy after this operation?
   a. Yes
   b. No
3. Would you advise this operation to your friends?
   a. Yes
   b. No

- **10 patients responded positively to the question about the comfort of the operation and answered this question as "well" or "very well."**

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Patient No.	Sex/ Age	Body weight/ Height (kg/cm)	Amount of LA (ml)	Anesthetic level	Bromage scale	RSCO score	Referred pain*	Site of needle insertion	Notes
1	F/70	49/148	16	T3-L5	2	−20	1	T11-12	
2	F/75	45/152	16	T1↓	NC	−15	0	L3-4	Assisted entilation
3	M/27	59/163	16	T4-L3	0	15	3	T10-11	conversion to G/A
4	F/70	49/145	13	T5↓	3	−15	2	L2-3	
5	F/45	51/160	14	T3-L4	1	−15	2	T10-11	
6	M/35	90/176	18	T3↓	3	−9	2	L3-4	
7	F/58	45/149	12	T3-S1	2	−20	1	T12-L1	
8	M/60	72/170	14	T5-L2	1	−4	1	T10-11	
9	M/52	62/165	14	T3-L4	1	−9	2	T11-12	
10	F/55	60/150	11	T5-L2	1	−20	2	T11-12	
11	M/48	70/165	14	T2-L4	2	−9	1	T10-11	
12	M/62	68/170	14	T3-L4	1	−4	1	T11-12	

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- Adverse Effect of Epidural Anesthesia observed during Laparoscopic Cholecystectomy

Adverse effect	No. of patients (n = 12)
Hypotension	8
Bradycardia (HR < 50 bpm)	2
Urinary retension	1
Nausea/Vomiting	0

- **In conclusion, this study has provided preliminary evidence that epidural anesthesia can be effective for LC in treating gall stones.**

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Respiratory Changes During Spinal Anaesthesia for Gynaecological Laparoscopic Surgery

Raju N Pusapati, T Sivashanmugam, and M Ravishankar

J Anaesthesiol Clin Pharmacol. 2010 Oct-Dec; 26(4): 475–479.

- Spinal anaesthesia was administered under aseptic precaution at L3-L4 interspace with a mixture of hyperbaric bupivacaine 15 mg (3 ml) and 50 mcg (1 ml) of fentanyl
- The patients were given lithotomy position with 10° head down tilt immediately after spinal to ensure total sensory block of T4-5

Total number of patients	41
Withdrawn from analysis	4
Short duration of surgery <20min	3
Inadequate analgesia	1
Number of case analysed (n)	37
Median age [range]	31 [20 - 52]
Median body weight [range]	53 [40 - 70]
Median sensory level [range]	'T'5 ['T'2 - 'T'6]
Median analgesia level [range]	'C'6 ['C'3 - 'T'3]
Proceedure	
Lap assisted vaginal hysterectomy	15 (40.5%)
Diagnostic laparoscopy (infertility)	14 (37.8%)
Lap ovarian cystectomy	6 (16.2%)
Lap sterilization	2 (5.5%)

'T' – Thoracic dermatome
'C' – Cervical dermatome

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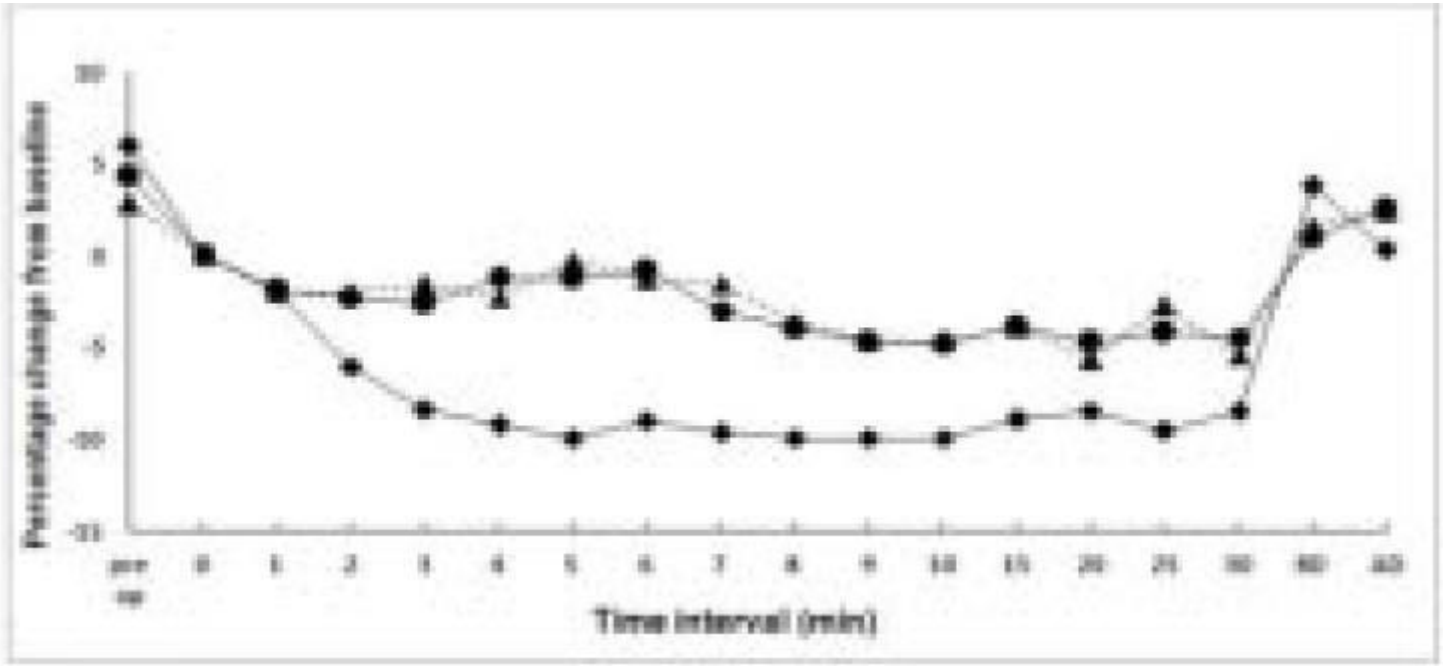
- Percentage change of heart rate ( ), systolic ( ) and diastolic ( ) blood pressure from baseline (time 0) plotted over time.



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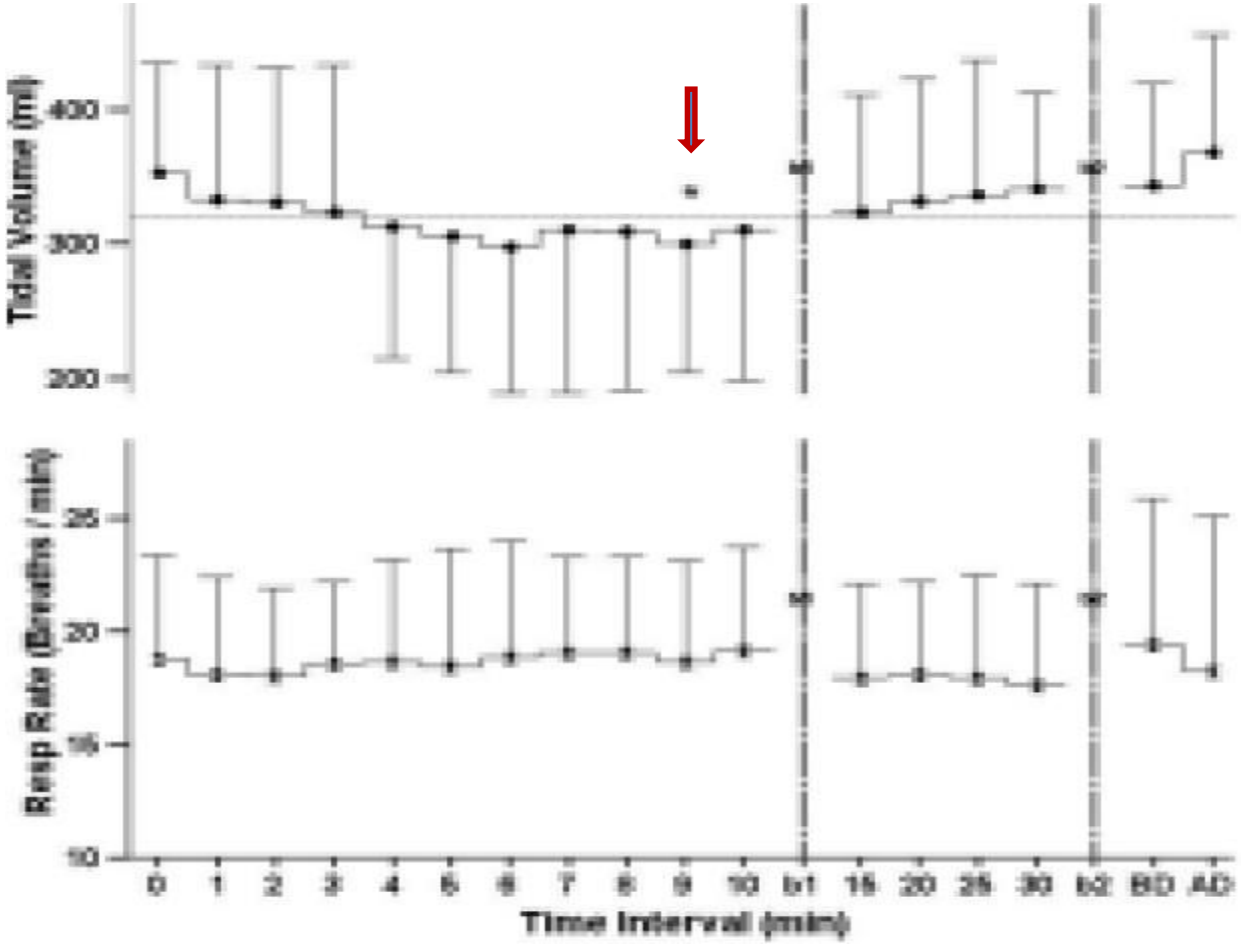
Changes in tidal volume () and respiratory rate () plotted overtime, expressed as mean and standard deviation, interpolation line center step * p = 0.032 compared to time 0 b1, b2 – Changing time intervals b2 – varied from 40 to 120 min **...**



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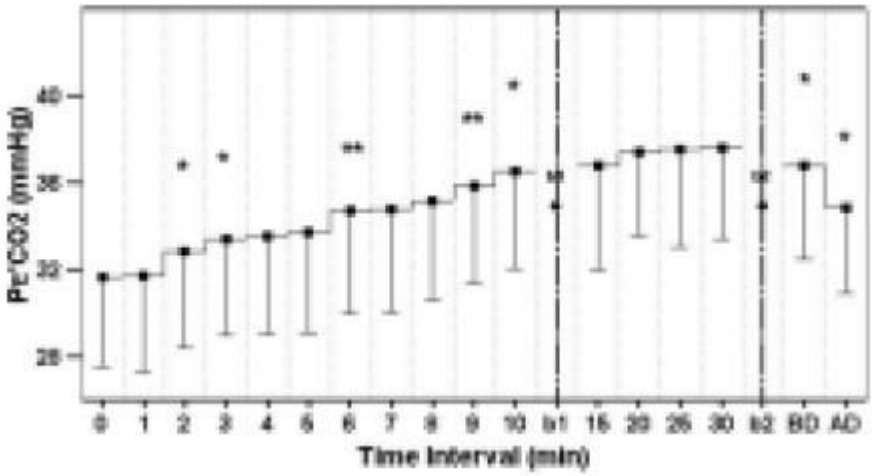
Changes in **end tidal CO2** () plotted over time, expressed as mean and standard deviation, interpolation line center step. * p < 0.05 compared to previous time interval * p < 0.005 compared to previous time interval b1, b2 – Changing **...**



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Complication	Incidence (n = 37)
Bradycardia (Needing 0.6mg atropine)	1 (2.7%)
Hypotension (Needing 6mg mephentermine once)	9 (24.32%)
PE'CO2 > 45mmHg	2 (5.4%)
Shoulder / neck pain	3 (8.1%)
Pruritus (Needing treatment)	1 (2.7%)
Nausea / vomiting	Nil
Respiratory insufficiency (MV < 100ml/Kg)	Nil

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Conclusion:

- In a conscious patient undergoing laparoscopy with pneumoperitoneum, under spinal anaesthesia, **the preserved inspiratory diaphragmatic activity maintains ventilation** and, **the gas exchange** within physiological limits
- Hence it is a safe alternative to general anaesthesia

Combined spinal epidural anesthesia for laparoscopic appendectomy in adults: A case series

Rajesh S Mane, Manjunath C Patil, KS Kedareshvara, CS Sanikop

Saudi J Anaesth 2012;6:27-30

Saudi Journal of Anaesthesia

- Eight ASA Grade I and II adult patients undergoing elective Laparoscopic appendectomy received **Combined Spinal Epidural** Anaesthesia.

- Spinal Anaesthesia was performed at L_2 -L_3 interspace using 2 ml of 0.5% (10 mg) hyperbaric Bupivacaine mixed with 0.5ml (25 micrograms) of Fentanyl.

- Epidural catheter was inserted at T_{10} -T_{11} interspace for inadequate spinal anaesthesia and postoperative pain relief.

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Saudi Journal of Anaesthesia

- Patient characteristics and outcome indicators

Sex: M:F (n)	5:3
Age (years)	36.5 (25–48)
Weight (kg)	52 (48–58)
ASA grade (I:II) (n)	6:2
Duration of surgery (min)	49 (35–63)
Intraoperative fluid volume (ml)	1250 (1030–1470)
Surgical conditions: Excellent:Good:Poor (n)	6:2:0

Data expressed in mean, range, and number of patients (n); ASA = American Society of Anesthesiologists

Saudi Journal of Anaesthesia

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- Anesthetic outcome

Duration (min)	Dermatomal level of sensory blockade
15	T5 (T4–T6)
30	T5 (T4–T6)
60	T6 (T5–T7)
75	T7 (T6–T8)
90	T10 (T9–T11)

Data expressed in mean and range

Saudi Journal of Anaesthesia

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- Perioperative side effects and medication

Shoulder pain (n)	2
Abdominal pain (n)	1
Nausea/vomiting (n)	1
Respiratory depression RR <10	0
Midazolam 2 mg (n)	1
Fentanyl (0:50:100 mg)	6:2:0
Ephedrine (0:6 mg)	6:2

Data expressed as number of patients (n)

- **In conclusion, laparoscopic appendectomy was successfully performed under combined spinal epidural anesthesia without any significant complications and thus can be an effective anesthetic technique for laparoscopic surgeries**

The Saudi Journal of Gastroenterology

Experience of laparoscopic cholecystectomy under spinal anesthesia with low-pressure pneumoperitoneum - prospective study of 300 cases

Manoranjan Kar[1], Jugal K Kar[2], Bibhas Debnath

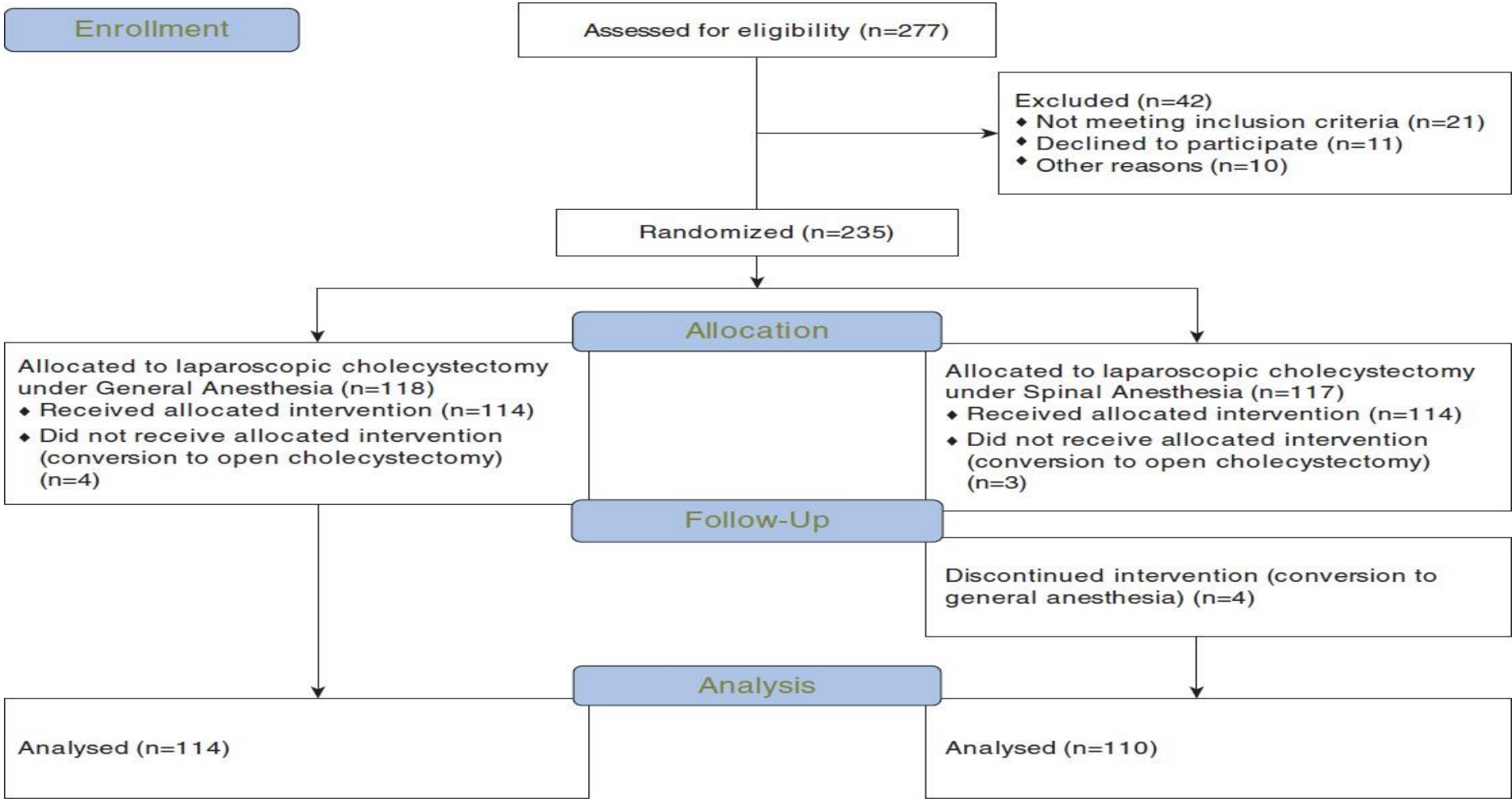
2011: 17; 3: 203-207

- **Conclusion** : Laparoscopic cholecystectomy under spinal anesthesia with low-pressure pneumoperitoneum can be performed safely and satisfactorily without major complications by experienced surgeons

Journal of Minimal Access Surgery

Laparoscopic cholecystectomy under spinal anaesthesia: A prospective, randomised study 2011

Sangeeta Tiwari[1], Ashutosh Chauhan[1], Pallab Chaterjee[1], Mohammed T Alam[2]
[1] Department of Surgery, Military Hospital, Agra, Uttar Pradesh, India
[2] Department of Anaesthesia, Military Hospital, Agra, Uttar Pradesh, India



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[1] Department of Surgery, Military Hospital, Agra, Uttar Pradesh, India
[2] Department of Anaesthesia, Military Hospital, Agra, Uttar Pradesh, India

- Intraoperative Events in Spinal Anesthesia Group (n=114)

Event	Number (n)
Discomfort Abdomen	9
Referred Shoulder pain	8
Hypotension	5
Nausea/ Vomiting	3
Anxiety	2

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Laparoscopic cholecystectomy under spinal anaesthesia: A prospective, randomised study

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[1] Department of Surgery, Military Hospital, Agra, Uttar Pradesh, India
[2] Department of Anaesthesia, Military Hospital, Agra, Uttar Pradesh, India

- Post operative events

Event	GA Group (n=114)	SA Group (n=110)
Pain Abdomen	12	Nil
Nausea/vomiting	6	Nil
Urinary retention	1	4
Hypotension	nil	2
Head ache	1	3
Pain Back	nil	2
Sore throat	4	nil

Spinal Analgesia for Laparoscopic Colonic Resection Using an Enhanced Recovery After Surgery Programme Better Analgesia, but no Benefits on Postoperative Recovery: A Randomized Controlled Trial

M. Wongyingsinn, G. Baldini, B. Stein, P. Charlebois, S. Liberman, F. Carli

Br J Anaesth. 2012;108(5):850-856.

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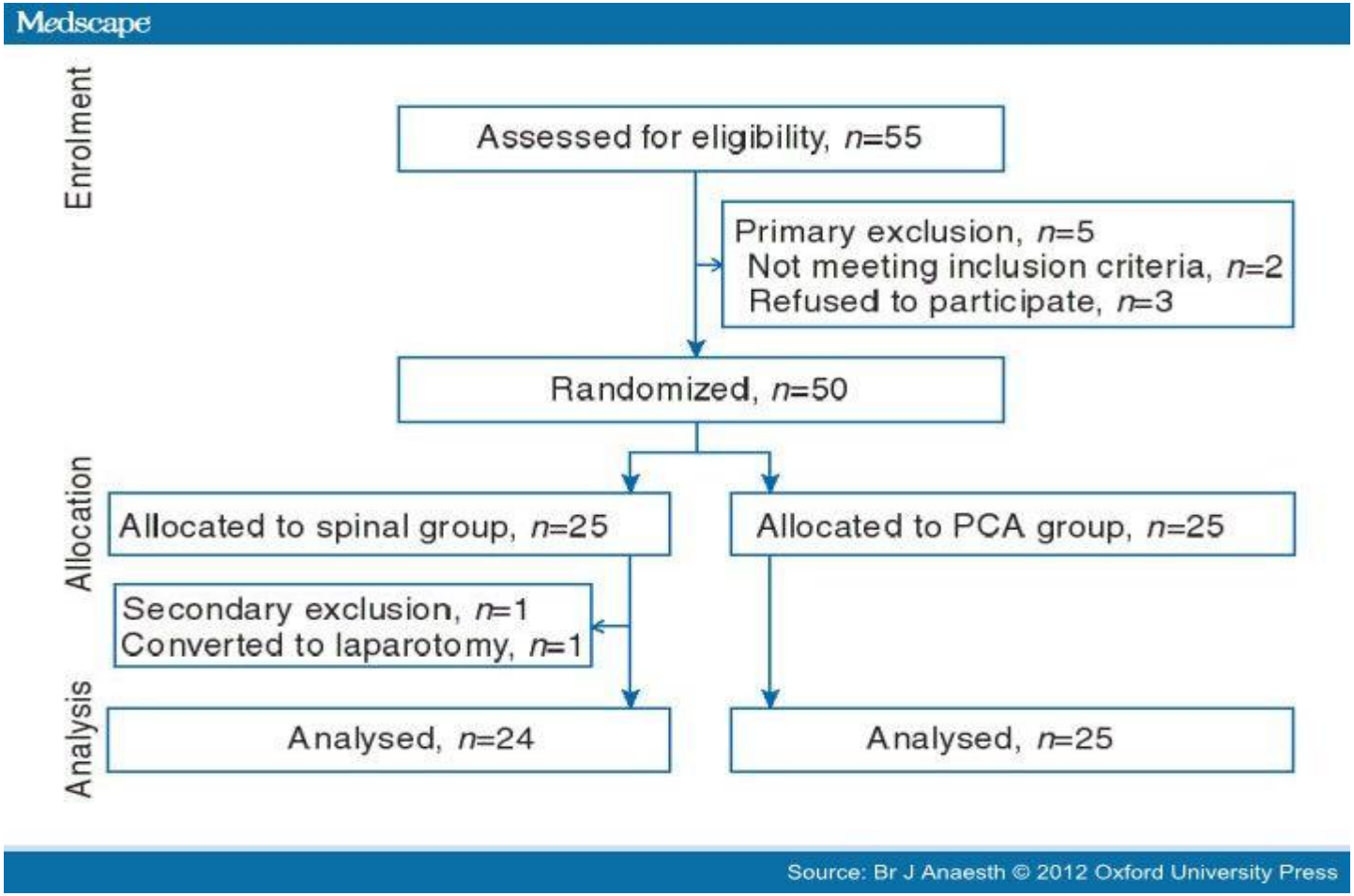

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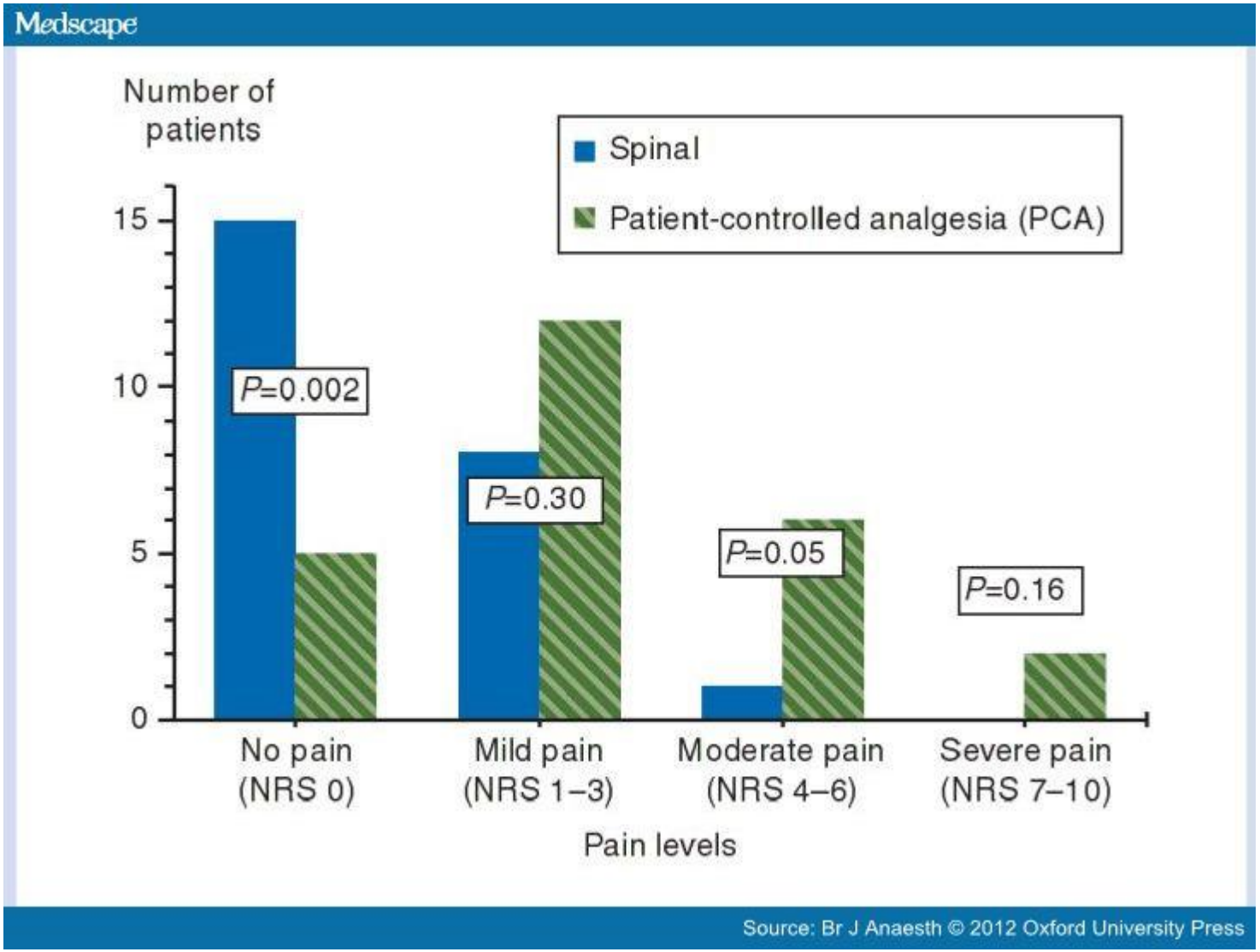

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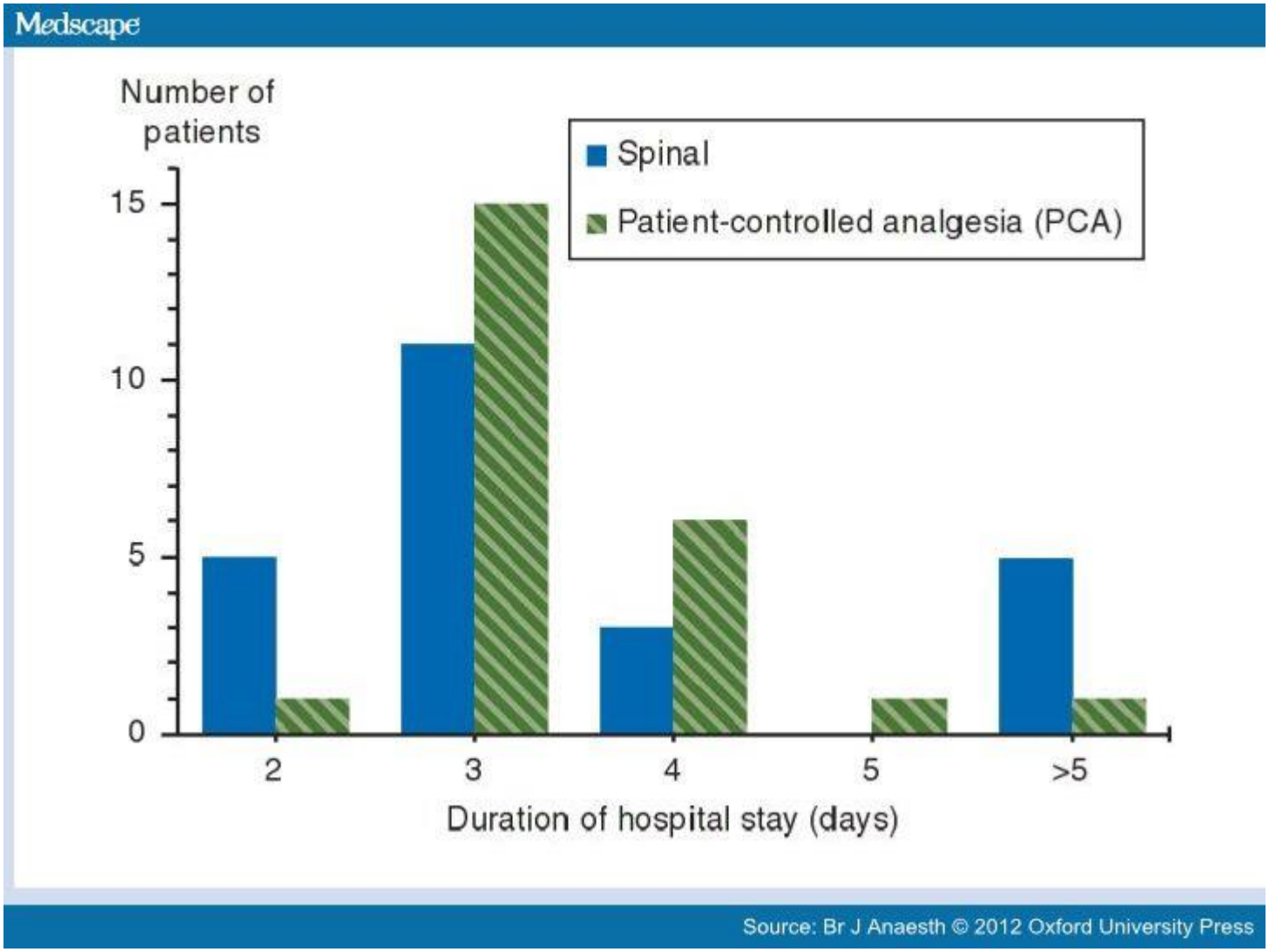


Spinal Analgesia for Laparoscopic Colonic Resection Using an Enhanced Recovery After Surgery Programme Better Analgesia, but no Benefits on Postoperative Recovery: A Randomized Controlled Trial
M. Wongyingsinn, G. Baldini, B. Stein, P. Charlebois, S. Liberman, F. Carli
Br J Anaesth. 2012;108(5):850-856.

- In conclusion, in patients undergoing laparoscopic colon surgery an intrathecal mixture of **bupivacaine and morphine** followed was associated with less postoperative opioid consumption compared with systemic morphine.

- However, the short period (24 h) of significant analgesia and the potential risk of excessive sedation and respiratory depression in an elderly population must be taken into consideration

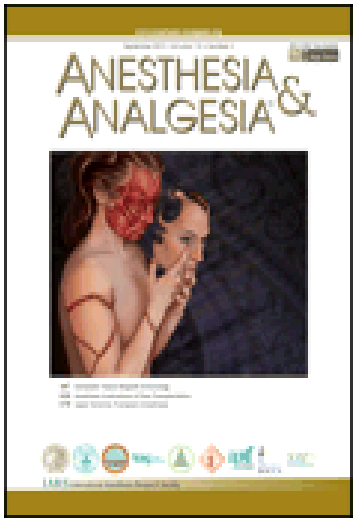
The Effect of Intraperitoneal Local Anesthesia in Laparoscopic Cholecystectomy: A Systematic Review and Meta-Analysis

Alexander P. Boddy, BM, BCh,
Samir Mehta, BM, BCh and
Michael Rhodes, MD

April 25, 2006

ANESTHESIA & ANALGESIA®
The Gold Standard in Anesthesiology

- the use of intraperitoneal local anesthesia is safe, and it results in a statistically significant reduction in early postoperative abdominal pain



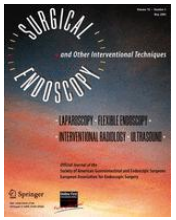
The Beneficial Effect of Transversus Abdominis Plane Block After Laparoscopic Cholecystectomy in Day-Case Surgery: A Randomized Clinical Trial

Pernille Lykke Petersen, MD*, Pia Stjernholm, MD*, Viggo B. Kristiansen, MD†, Henrik Torup, MD‡, Egon G. Hansen, MD‡, Anja U. Mitchell, MD‡, Ann Moeller, MD‡, Jacob Rosenberg, MD§, Joergen B. Dahl, MD‖ and Ole Mathiesen, MD

May 10, 2012

- TAP block after laparoscopic cholecystectomy may have some beneficial effect in reducing pain while coughing and on opioid requirements, but this effect is probably rather small

Laparoscopic cholecystectomy performed under regional anesthesia in patients with chronic obstructive pulmonary disease



L. Gramatica, O.E. Brasesco, A. Mercado Luna, V. Martinessi, G. Panebianco, F. Labaque, D. Rosin, R.J. Rosenthal, L. Gramatica

March 2002, Volume 16, Issue 3, pp 472-475

Laparoscopic cholecystectomy has been successfully performed using epidural anesthesia.

We evaluated our experience with this surgical approach in high-risk patients.

Methods:

29 patients with gallstones who, between 1998 and 1999, underwent laparoscopic cholecystectomy with epidural anesthesia.

All patients had chronic obstructive pulmonary disease

Results:

All 29 surgeries were successfully completed via laparoscopy and with the patients under epidural anesthesia.

No patient required endotracheal intubation during surgery or pain medication afterward.

Postoperatively, 1 patient developed a wound infection and 3 patients developed urinary retention.

Conclusion:

laparoscopic cholecystectomy was feasible under epidural anesthesia and it eliminated the need for postoperative analgesia.

We believe that this approach should be considered for patients who require biliary surgery but who are not good candidates for general anesthesia due to cardiorespiratory problems.

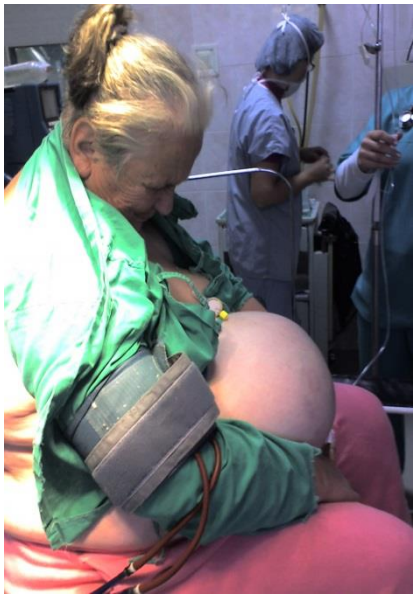
Journal of Minimal Access Surgery

2016; 12: 4-9

Anaesthesia for laparoscopic surgery: General vs regional anaesthesia S J S Bajwa, A Kulshrestha

Authors	Number of patients included	Outcomes measured	Results
Imbelloni et al. 2011	33 patients in GA (n=33) vs 35 Patients (n=35) in spinal group using low pressure pneumoperitoneum (8 mmHg)	Post-operative pain, hemodynamic parameters, complications, recovery, patient satisfaction and cost	Significantly lower pain at 2 h, 4 h and 6 h post-operatively in spinal group with lower cost and complete satisfaction. Perioperative vasopressor was given in 41% of patients in spinal group vs 3% of patients in GA group. 47% of patients in spinal group had shoulder-tip pain requiring analgesics
Ellakany 2013	20 patients each in GA vs spinal group (n=20) using low pressure pneumoperitoneum (10 mmHg)	Post-operative pain, intraoperative parameters, complications, recovery time and patient satisfaction	Significantly lower recovery and discharge time (81 min vs 111.9 min) with good patient satisfaction scores (3.6 vs 2.9) in spinal group but higher incidence of hypotension and bradycardia (40%) and abdominal discomfort (25%). The surgeon satisfaction scores were higher for GA group compared to regional group (3 vs 4.1)
Mehta et al. 2010	30 patients each in spinal vs GA (n=30) using normal pressure pneumoperitoneum (12 mmHg)	Post-operative pain, intraoperative and post-operative complications, recovery, hospital stay and degree of satisfaction	Significantly reduced pain scores (VAS) at 4 h, 8 h, 12 h, 24 h post-operatively in spinal anaesthesia group with no difference regarding complications, recovery, stay or degree of satisfaction between two groups. Hypotension was noted in 30% cases of spinal vs 10% cases in GA group, with more incidence of shoulder discomfort (10%) intraoperatively
Tiwari et al. 2013	114 patients in GA (n=114) vs 110 patients in spinal group (n=110) using low pressure (8-10 mmHg) pneumoperitoneum	Mean anaesthesia time, pneumoperitoneum time, surgery time as primary outcomes and intraoperative events and post-operative pain scores as secondary outcomes	4 patients from spinal group were converted to GA due to intraoperative events (abdominal pain, anxiety and nausea). Significantly more mean anaesthesia time in GA group but a longer pneumoperitoneum and total surgery time in spinal group (36.11±4.98 vs 34.22±5.83) Significantly lower pain scores post-operatively in spinal group at 6 h and 12 h but not at 24 h. The patients in spinal group had more incidences of hypotension, urinary retention and pain in back and patients in GA group had more incidences of abdominal pain, PONV and sore throat, post-operatively
Turkstani et al. 2009	25 patients each in GA vs spinal group (n=25) using low pressure (≤10 mmHg) pneumoperitoneum	Post-operative pain scores (VAS), total dose of analgesic used, hospital length of stay and cost of each anaesthetic technique	Significantly lower pain scores (VAS) at admission to PACU (1.4±0.8 vs 4.7±1.4) with lower analgesic requirements (12% vs 52%) in spinal group with significantly lower cost of anaesthesia. No significant difference regarding hospital length of stay. Intraoperatively, additional analgesics required in 88% patients in GA vs 12% patients in spinal group with 48% patients experiencing shoulder-tip pain in spinal group

Case presentation 1



- 76 years old
- Severe COPD
- Morbid obese
- HBP under medication
- Acute cholecystitis
- CSE
- Laparoscopic cholecystectomy
- Uneventful anaesthesia

Case presentation 2

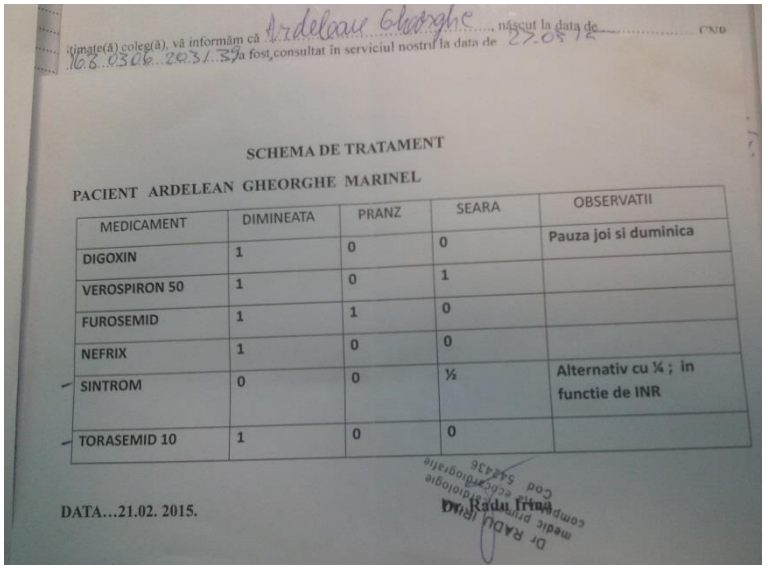
- **B-M S 47 ani, sex M**
- **Piocolecistită acută flegmonoasă litiazică**

- Insuf cardiacă congestivă NYHAIII. Boală Ebstein. Defect de sept atrial tip ostium secundum cu șunt stânga dreapta. IM grIII, IT grIII. FIA permanentă cu AV medie. HTP sec. severă

- **Colecistectomie laparoscopică**

- Anestezie subarahnoidiană cu Marcainã hiperbară 0,5% + fentanyl, sedare fentanyl + midazolam
- Evoluție intra și postanestezică favorabilă

Case presentation 3



Stimate(ă) coleg(ă), vă informăm că Ardelean Gheorghe, născut la data de [illegible] CNP 1680306203137, a fost consultat în serviciul nostru la data de 27.05.12

SCHEMA DE TRATAMENT

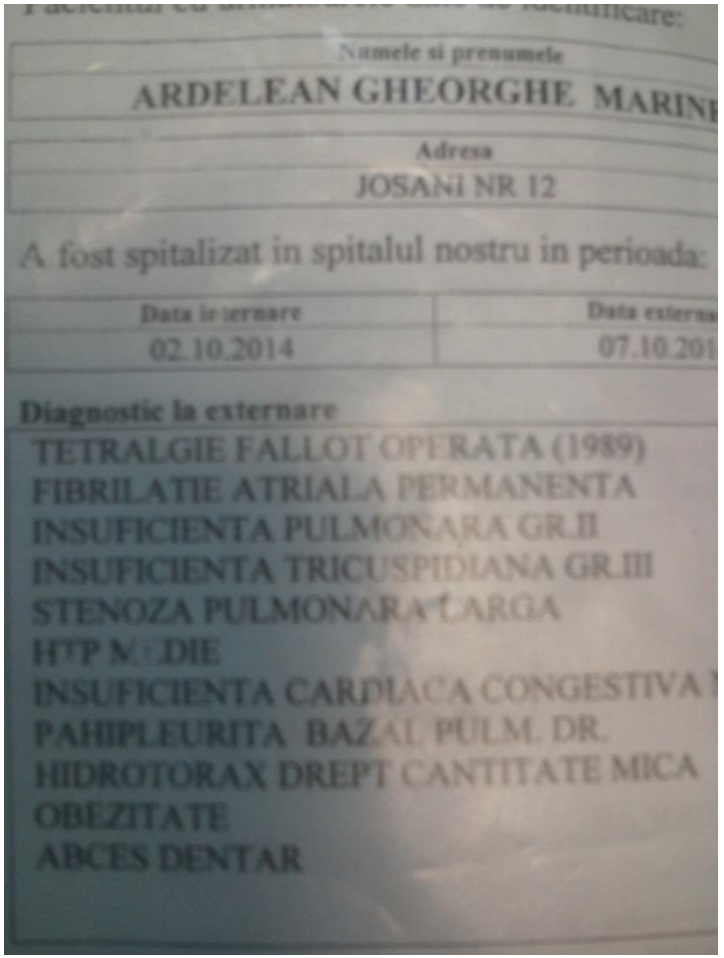
PACIENT ARDELEAN GHEORGHE MARINEL

MEDICAMENT	DIMINEATA	PRANZ	SEARA	OBSERVATII
DIGOXIN	1	0	0	Pauza joi si duminica
VEROSPIRON 50	1	0	1	
FUROSEMID	1	1	0	
NEFRIX	1	0	0	
SINTROM	0	0	½	Alternativ cu ¼ ; in functie de INR
TORASEMID 10	1	0	0	

DATA...21.02. 2015.

Dr. Radu Irina

Dr. RADU IRINA medic primar radiologie competenta radiodiagnostic Cod 544436



Numele si prenumele

ARDELEAN GHEORGHE MARINI

Adresa

JOSANI NR 12

A fost spitalizat in spitalul nostru in perioada:

Data internare	Data externa
02.10.2014	07.10.201

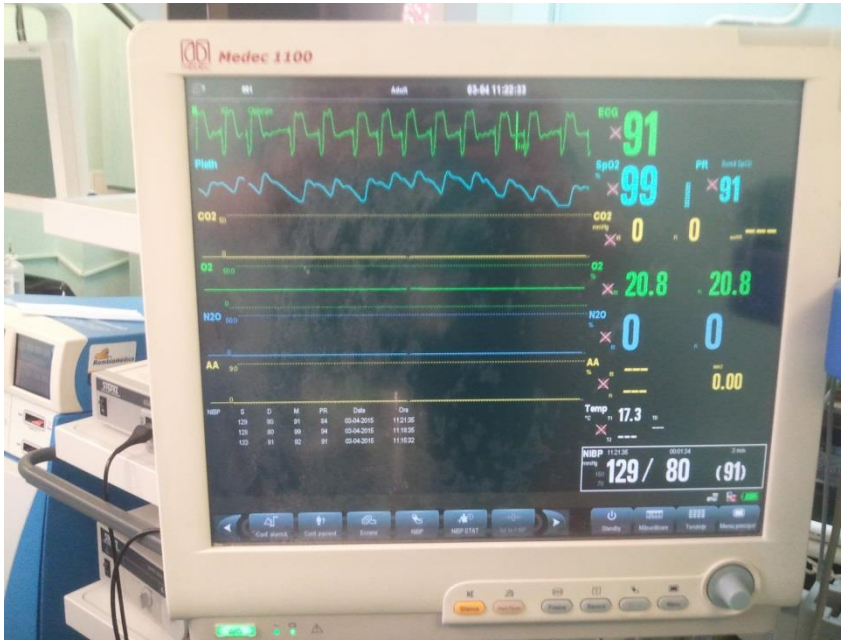
Diagnostic la externare

TETRALGIE FALLOT OPERATA (1989)
FIBRILATIE ATRIALA PERMANENTA
INSUFICIENTA PULMONARA GR.II
INSUFICIENTA TRICUSPIDIANA GR.III
STENOZA PULMONARA LARGA
HTP M. DIE
INSUFICIENTA CARDIACA CONGESTIVA
PAHIPLEURITA BAZAL PULM. DR.
HIDROTORAX DREPT CANTITATE MICA
OBEZITATE
ABCES DENTAR

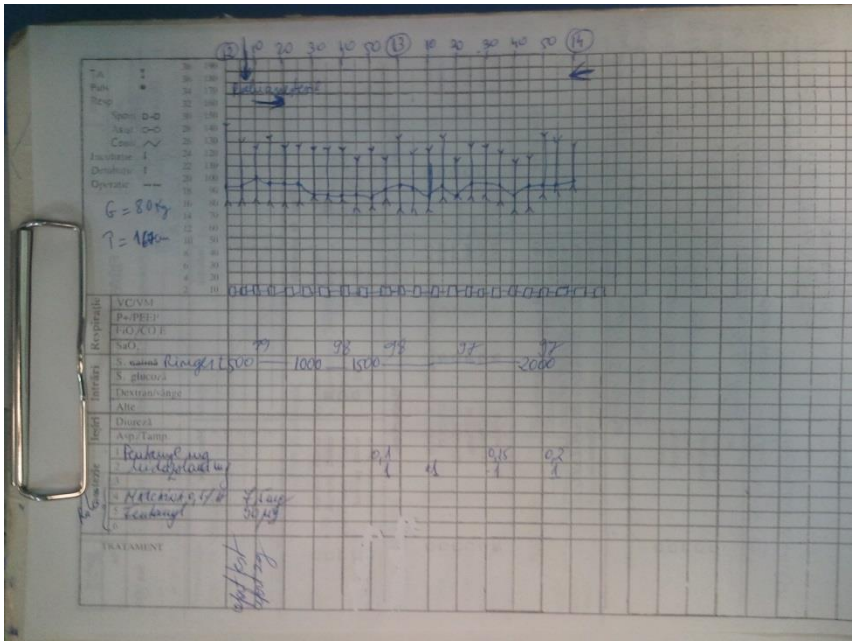
Case presentation 3

- Rezecție sigmoidiană asistată laparoscopic
- Anestezie spinală cu marcainã 0,5% hiperbară și fentanyl
- Sedare cu midazolam și fentanyl

Case presentation 3



Case presentation 3
Uneventful anaesthesia



Conclusions

- **Laparoscopic surgery has managed to reduce postoperative morbidity, shorten hospital stay and increase the day-surgery procedures**
- **The last years however, studies can be found in the literature supporting the feasibility of RA for laparoscopic general surgery cases**
- **The evidence suggests the safety of the use of spinal, epidural and combined spinal-epidural anaesthesia in laparoscopy with minimal side effects which can easily be managed with the available pharmacological drugs**
- **RA may provide certain advantages over GA, such as lack of airway manipulation, maintenance of spontaneous respiration, effective post-operative analgesia, minimal nausea and vomiting, and early recovery and ambulation**

Conclusions

- **These data are encouraging enough, in order to think about changing our opinion about laparoscopic surgery and RA**
- **It is time for us anaesthesiologists to stop ignoring this new era**
- **It is time to study and bring the benefits of RA to our patients, who will undergo laparoscopic surgery**
- **Before this time comes, however, there are a lot of questions to be answered and we need more studies in order to get the most of RA in laparoscopic surgery**


THE END
Thank you