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**СПИНАЛЬНАЯ АНЕСТЕЗИЯ КАК АЛЬТЕРНАТИВА ОБЩЕЙ  
ЭНДОТРАХЕАЛЬНОЙ АНЕСТЕЗИИ  
ПРИ ЛАПАРОСКОПИЧЕСКОЙ ХОЛЕЦИСТЭКТОМИИ**

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**SPINAL ANESTHESIA AS AN ALTERNATIVE TO GENERAL  
ENDOTRACHEAL ANESTHESIA  
FOR LAPAROSCOPIC CHOLECYSTECTOMY**

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**Резюме.** В данной статье исследован опыт анестезиологов из госпиталя в Индии применения спинальной анестезии как безопасной альтернативы общей анестезии при лапароскопической холецистэктомии. Представлена методика проведения и сравнительные характеристики двух методов обезболивания по нескольким параметрам.

**Ключевые слова:** лапароскопическая холецистэктомия, нейроаксиальная регионарная анестезия, общая анестезия, спинальная анестезия.

**Resume.** In this article spinal anesthesia (SA) is considered as a safe, economically advantageous alternative method to the GA. I would like to share an experience of the Indian anesthesiologists. The technique and comparative characteristics of two methods of anesthesia in several parameters are presented.

**Keywords:** laparoscopic cholecystectomy, neuraxial regional anesthesia, spinal anesthesia, general endotracheal anesthesia.

**Relevance.** GETA currently is the main method of anesthesia for LC due to precise control of ventilation and the respiratory changes caused by pneumoperitoneum, as an integral part of laparoscopy. But according to the experience of Indian anesthesiologists, SA can be a safe and relatively cheap method of anesthesia. Among other advantages we can also admit less postoperative complications including pain, nausea and vomiting and also the ability to ambulate patients earlier than after GETA.

**Purpose:** to prove that SA is a feasible and safe alternative method of anesthesia for LC.

**Tasks:**

1. To evaluate and compare the intra-operative outcome and duration of operating time in patients who received GETA and SA.
2. To follow up the patients after surgery and analyze the postoperative patients' conditions including primary outcomes, postoperative complications.

**Materials and methods.** An analysis of the data from surgical department of laparoscopy, in which around 40 patients were under observation in India after LC. Their characteristics were taken into account, including patients' age, gender, body mass index (BMI). In the GETA group, anesthesia was applied with 2.5 mg/kg of propofol and 0.6

mg/kg<sup>-1</sup> of rocuronium. Maintenance of anesthesia was done with O<sub>2</sub>, N<sub>2</sub> O and sevoflurane. In the SA group, the patients were placed in sitting or left lateral decubitus position as deemed comfortable. The subarachnoid space puncture was performed between the L3 -L4 apophyses and 2.5-3.5 ml of hyperbaric 0.5% bupivacaine were injected. Afterwards, patients were placed in the supine position with a head-down position. After the surgeon confirmed anesthesia at T4 level by pin prick, “go-ahead” was given. Intra-operative events were evaluated including hypotension, respiratory disorders, right shoulder pain, nausea, vomiting as well as post operative complications including nausea, vomiting, urinary retention, overall morbidity etc. It was recorded which anesthetic procedure (SA or GETA) was performed. We used a visual analogue scale (VAS) to access abdominal pain in the postoperative period.

**Results and their discussion.** GETA is currently the method of the first choice for laparoscopic cholecystectomy (LC). However, it’s disadvantages including complexity of implementation, relatively high-cost lead to the search for other methods of anesthesia Postoperative pain using a VAS was assessed. It was checked in 2-4 hrs and 24 hrs after operation.

**Tab. 1.** Visual analogue score of the observations during 1 year

Observations	VAS (2-4 hrs)		VAS (24 hrs)	
	SA	GETA	SA	GETA
Period 1	5 (0-10)	7 (3-10)	2 (0-3)	2 (0-6)
Period 2	4 (0-8)	6 (0-10)	1 (0-3)	2 (0-5)
Period 3	0 (0-4)	3 (0-7)	0 (0-2)	1 (0-5)

There were very less cases of postoperative pain in SA as compared to GETA during the first 2-4 hrs, but in 24 hrs there were no significant difference between SA and GETA related to postoperative pain. However, SA may be preferable to lower the postoperative pain during 2-4 hrs.

Intra-operative events, including hypotension, operating time right shoulder pain, nausea and vomiting were also evaluated.

**Tab. 2.** Recorded operating time during observations

Procedure	Operating time (min)	
	SA	GA
Period 1	66 ± 12	69 ± 13
Period 2	45.5 ± 8.2	44.7 ± 9
Period 3	70 ± 17.5	68 ± 15

There was no significant difference in operating time for both procedures therefore it was impossible to say which method was more beneficial.

**Tab. 3.** Intra-operative outcomes during period of observations

Hypotension	Shoulder pain	Nausea and vomiting
6	2	-
3	5	1
4	3	-

During SA procedure, there was less chances of nausea, vomiting and right shoulder pain, but intra-operative hypotension may cause complications. Intravenous ephedrine injection proved to be very effective in such cases. According to the collected data complications including postoperative nausea and vomiting were observed more often under GA than SA. It occurred rarely under SA. It was impossible to assess shoulder pain when GETA was applied Overall patient had fewer events of postoperative complications under SA than GETA.

### **Conclusions:**

1. There was no significant difference in operating time between SA and GETA.
2. According to VAS, post-operative pain was less under SA than under GETA.
3. Post-operative complications including nausea, vomiting were observed more often under GETA than SA
4. SA is a feasible and safe alternative for elective LC.

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