



Postoperative Shoulder Pain after Laparoscopic Surgery

Sun Jin Park, M.D., Ph.D.

Department of Surgery, Kyung Hee University College of Medicine, Seoul, Korea

We often encounter patients complaining of shoulder pain after laparoscopic surgery. The pain mechanism is believed to be due to the diaphragmatic overstretching under pressure in a pneumoperitoneum, which causes referred pain to the shoulder, but the exact mechanism has not been clarified.

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Corresponding author

Sun Jin Park

Department of Surgery, Kyung Hee University Hospital, 26 Kyunghee-daero 23, Dongdaemun-gu, Seoul 02447, Korea

Tel: +82-2-958-8241

Fax: +82-2-966-9366

E-mail: gsdrpark@naver.com

ORCID:

<https://orcid.org/0000-0001-7117-4479>

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We often encounter patients complaining of shoulder pain after laparoscopic surgery in clinical practice. The authors conducted a prospective study with curiosities about the clinical situation of shoulder pain after laparoscopic appendectomy.¹ As a result of a multivariate analysis, low body weight was suggested as the only risk factor of shoulder pain in their study. Actually, we experience many low-weight patients with shoulder pain after laparoscopic surgery. Despite an interesting clinical situation, there were some questions in this study. We did not know what the incidence of shoulder pain was in this study. It would be appropriate to compare patients with and without shoulder pain. Instead, they divided patients into two groups based on the pain score of 4. They defined a visual analogue score (VAS) of 4 as the minimum pain points as it was reported that VAS scores of 3.5 to 6.4 implied moderate pain in a study.² A receiver operating characteristic (ROC) curve is

frequently used to choose the most appropriate cut-off for a test. It would have been better if a threshold pain score was determined first after ROC analysis and then univariate and multivariate analysis were performed.

The incidence of shoulder pain was reported by 63% after laparoscopic cholecystectomy,³ 66% after laparoscopic gastric band surgery,⁴ and 83% after gynecological laparoscopic surgery.⁵ Although the exact mechanism of shoulder pain after laparoscopic surgery has not been clarified, a leading hypothesis is that excessive stretching of the diaphragm due to the pressure of a pneumoperitoneum, which results in phrenic nerve-mediated referred pain to the shoulder.⁶⁻⁸ Shin et al.⁹ evaluated whether mechanical ventilation with a low tidal volume (LTV, 7 ml/kg) might reduce shoulder pain in patients undergoing laparoscopic appendectomy compared with ventilation with the traditional tidal volume (TTV, 10 ml/kg).

However, the overall incidence of shoulder pain was similar in both groups (57.1% in LTV group vs. 65.5% in TTV group). The pain score did not decrease in the LTV group compared with the TTV group. They concluded that mechanical ventilation with a LTV of 7 ml/kg does not reduce the frequency and severity of shoulder pain after laparoscopic appendectomy compared with ventilation with a TTV of 10 ml/kg. A randomized controlled trial with 116 patients demonstrated that shoulder pain as well as postoperative nausea and vomiting was effectively reduced by a simple clinical maneuver of removing residual intra-abdominal carbon dioxide before closing the laparoscopic wounds.⁵

ORCID

Sun Jin Park, <https://orcid.org/0000-0001-7117-4479>

CONFLICT OF INTEREST

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