

World Journal of *Clinical Cases*

World J Clin Cases 2022 November 26; 10(33): 12066-12461



Contents

Thrice Monthly Volume 10 Number 33 November 26, 2022

MINIREVIEWS

- 12066** Review of risk factors, clinical manifestations, rapid diagnosis, and emergency treatment of neonatal perioperative pneumothorax
Zhang X, Zhang N, Ren YY

ORIGINAL ARTICLE

Clinical and Translational Research

- 12077** Integrative analysis of platelet-related genes for the prognosis of esophageal cancer
Du QC, Wang XY, Hu CK, Zhou L, Fu Z, Liu S, Wang J, Ma YY, Liu MY, Yu H
- 12089** Comprehensive analysis of the relationship between cuproptosis-related genes and esophageal cancer prognosis
Xu H, Du QC, Wang XY, Zhou L, Wang J, Ma YY, Liu MY, Yu H
- 12104** Molecular mechanisms of Baihedihuang decoction as a treatment for breast cancer related anxiety: A network pharmacology and molecular docking study
Li ZH, Yang GH, Wang F
- 12116** Single-cell RNA-sequencing combined with bulk RNA-sequencing analysis of peripheral blood reveals the characteristics and key immune cell genes of ulcerative colitis
Dai YC, Qiao D, Fang CY, Chen QQ, Que RY, Xiao TG, Zheng L, Wang LJ, Zhang YL

Retrospective Study

- 12136** Diagnosis and treatment of tubal endometriosis in women undergoing laparoscopy: A case series from a single hospital
Jiao HN, Song W, Feng WW, Liu H
- 12146** Different positive end expiratory pressure and tidal volume controls on lung protection and inflammatory factors during surgical anesthesia
Wang Y, Yang Y, Wang DM, Li J, Bao QT, Wang BB, Zhu SJ, Zou L
- 12156** Transarterial chemoembolization combined with radiofrequency ablation in the treatment of large hepatocellular carcinoma with stage C
Sun SS, Li WD, Chen JL
- 12164** Coexistence of anaplastic lymphoma kinase rearrangement in lung adenocarcinoma harbouring epidermal growth factor receptor mutation: A single-center study
Zhong WX, Wei XF

Observational Study

- 12175** Prognostic values of optic nerve sheath diameter for comatose patients with acute stroke: An observational study

Zhu S, Cheng C, Wang LL, Zhao DJ, Zhao YL, Liu XZ

- 12184** Quality of care in patients with inflammatory bowel disease from a public health center in Brazil

Takamune DM, Cury GSA, Ferrás G, Herrerias GSP, Rivera A, Barros JR, Baima JP, Saad-Hossne R, Sasaki LY

- 12200** Comparison of the prevalence of sarcopenia in geriatric patients in Xining based on three different diagnostic criteria

Pan SQ, Li XF, Luo MQ, Li YM

Prospective Study

- 12208** Predictors of bowel damage in the long-term progression of Crohn's disease

Fernández-Clotet A, Panés J, Ricart E, Castro-Pocheiro J, Masamunt MC, Rodríguez S, Caballol B, Ordás I, Rimola J

Randomized Controlled Trial

- 12221** Protective effect of recombinant human brain natriuretic peptide against contrast-induced nephropathy in elderly acute myocardial infarction patients: A randomized controlled trial

Zhang YJ, Yin L, Li J

META-ANALYSIS

- 12230** Prognostic role of pretreatment serum ferritin concentration in lung cancer patients: A meta-analysis

Gao Y, Ge JT

CASE REPORT

- 12240** Non-surgical management of dens invaginatus type IIIB in maxillary lateral incisor with three root canals and 6-year follow-up: A case report and review of literature

Arora S, Gill GS, Saquib SA, Saluja P, Baba SM, Khateeb SU, Abdulla AM, Bavabeedu SS, Ali ABM, Elagib MFA

- 12247** Unusual presentation of Loeys-Dietz syndrome: A case report of clinical findings and treatment challenges

Azrad-Daniel S, Cupa-Galvan C, Farca-Soffer S, Perez-Zincer F, Lopez-Acosta ME

- 12257** Peroral endoscopic myotomy assisted with an elastic ring for achalasia with obvious submucosal fibrosis: A case report

Wang BH, Li RY

- 12261** Subclavian brachial plexus metastasis from breast cancer: A case report

Zeng Z, Lin N, Sun LT, Chen CX

- 12268** Case mistaken for leukemia after mRNA COVID-19 vaccine administration: A case report

Lee SB, Park CY, Park SG, Lee HJ

- 12278** Orthodontic-surgical treatment of an Angle Class II malocclusion patient with mandibular hypoplasia and missing maxillary first molars: A case report

Li GF, Zhang CX, Wen J, Huang ZW, Li H

- 12289** Multiple cranial nerve palsies with small angle exotropia following COVID-19 mRNA vaccination in an adolescent: A case report
Lee H, Byun JC, Kim WJ, Chang MC, Kim S
- 12295** Surgical and nutritional interventions for endometrial receptivity: A case report and review of literature
Hernández-Melchor D, Palafox-Gómez C, Madrazo I, Ortiz G, Padilla-Viveros A, López-Bayghen E
- 12305** Conversion therapy for advanced penile cancer with tislelizumab combined with chemotherapy: A case report and review of literature
Long XY, Zhang S, Tang LS, Li X, Liu JY
- 12313** Endoscopic magnetic compression stricturoplasty for congenital esophageal stenosis: A case report
Liu SQ, Lv Y, Luo RX
- 12319** Novel *hydroxymethylbilane synthase* gene mutation identified and confirmed in a woman with acute intermittent porphyria: A case report
Zhou YQ, Wang XQ, Jiang J, Huang SL, Dai ZJ, Kong QQ
- 12328** Modified fixation for periprosthetic supracondylar femur fractures: Two case reports and review of the literature
Li QW, Wu B, Chen B
- 12337** Erbium-doped yttrium aluminum garnet laser and advanced platelet-rich fibrin+ in periodontal diseases: Two case reports and review of the literature
Tan KS
- 12345** Segmental artery injury during transforaminal percutaneous endoscopic lumbar discectomy: Two case reports
Cho WJ, Kim KW, Park HY, Kim BH, Lee JS
- 12352** Pacemaker electrode rupture causes recurrent syncope: A case report
Zhu XY, Tang XH, Huang WY
- 12358** Hybrid intercalated duct lesion of the parotid: A case report
Stankevicius D, Petroska D, Zaleckas L, Kutanovaite O
- 12365** Clinical features and prognosis of multiple myeloma and orbital extramedullary disease: Seven cases report and review of literature
Hu WL, Song JY, Li X, Pei XJ, Zhang JJ, Shen M, Tang R, Pan ZY, Huang ZX
- 12375** Colon mucosal injury caused by water jet malfunction during a screening colonoscopy: A case report
Patel P, Chen CH
- 12380** Primary malignant pericardial mesothelioma with difficult antemortem diagnosis: A case report
Oka N, Orita Y, Oshita C, Nakayama H, Teragawa H
- 12388** Typical imaging manifestation of neuronal intranuclear inclusion disease in a man with unsteady gait: A case report
Gao X, Shao ZD, Zhu L

- 12395** Multimodality imaging and treatment of paranasal sinuses nuclear protein in testis carcinoma: A case report
Huang WP, Gao G, Qiu YK, Yang Q, Song LL, Chen Z, Gao JB, Kang L
- 12404** T1 rectal mucinous adenocarcinoma with bilateral enlarged lateral lymph nodes and unilateral metastasis: A case report
Liu XW, Zhou B, Wu XY, Yu WB, Zhu RF
- 12410** Influence of enhancing dynamic scapular recognition on shoulder disability, and pain in diabetics with frozen shoulder: A case report
Mohamed AA
- 12416** Acute myocardial necrosis caused by aconitine poisoning: A case report
Liao YP, Shen LH, Cai LH, Chen J, Shao HQ
- 12422** Danggui Sini decoction treatment of refractory allergic cutaneous vasculitis: A case report
Chen XY, Wu ZM, Wang R, Cao YH, Tao YL
- 12430** Phlegmonous gastritis after biloma drainage: A case report and review of the literature
Yang KC, Kuo HY, Kang JW
- 12440** Novel *TINF2* gene mutation in dyskeratosis congenita with extremely short telomeres: A case report
Picos-Cárdenas VJ, Beltrán-Ontiveros SA, Cruz-Ramos JA, Contreras-Gutiérrez JA, Arámbula-Meraz E, Angulo-Rojo C, Guadrón-Llanos AM, Leal-León EA, Cedano-Prieto DM, Meza-Espinoza JP
- 12447** Synchronous early gastric and intestinal mucosa-associated lymphoid tissue lymphoma in a *Helicobacter pylori*-negative patient: A case report
Lu SN, Huang C, Li LL, Di LJ, Yao J, Tuo BG, Xie R

LETTER TO THE EDITOR

- 12455** Diagnostic value of metagenomics next-generation sequencing technology in disseminated strongyloidiasis
Song P, Li X
- 12458** Diagnostic value of imaging examination in autoimmune pancreatitis
Wang F, Peng Y, Xiao B

ABOUT COVER

Editorial Board Member of *World Journal of Clinical Cases*, Cornelia Bala, MD, PhD, Professor, Department of Diabetes and Nutrition Diseases, "Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca 400006, Romania. cbala@umfcluj.ro

AIMS AND SCOPE

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING

The WJCC is now abstracted and indexed in Science Citation Index Expanded (SCIE, also known as SciSearch®), Journal Citation Reports/Science Edition, Current Contents®/Clinical Medicine, PubMed, PubMed Central, Scopus, Reference Citation Analysis, China National Knowledge Infrastructure, China Science and Technology Journal Database, and Superstar Journals Database. The 2022 Edition of Journal Citation Reports® cites the 2021 impact factor (IF) for WJCC as 1.534; IF without journal self cites: 1.491; 5-year IF: 1.599; Journal Citation Indicator: 0.28; Ranking: 135 among 172 journals in medicine, general and internal; and Quartile category: Q4. The WJCC's CiteScore for 2021 is 1.2 and Scopus CiteScore rank 2021: General Medicine is 443/826.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: *Ying-Yi Yuan*; Production Department Director: *Xiang Li*; Editorial Office Director: *Jin-Lei Wang*.

NAME OF JOURNAL

World Journal of Clinical Cases

ISSN

ISSN 2307-8960 (online)

LAUNCH DATE

April 16, 2013

FREQUENCY

Thrice Monthly

EDITORS-IN-CHIEF

Bao-Gan Peng, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati, Ja Hyeon Ku

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

PUBLICATION DATE

November 26, 2022

COPYRIGHT

© 2022 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Retrospective Study

Different positive end expiratory pressure and tidal volume controls on lung protection and inflammatory factors during surgical anesthesia

Yu Wang, Yi Yang, Ding-Mu Wang, Jie Li, Quan-Tang Bao, Bei-Bei Wang, Shu-Jun Zhu, Lu Zou

Specialty type: Anesthesiology

Provenance and peer review:

Unsolicited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): B
Grade C (Good): C
Grade D (Fair): 0
Grade E (Poor): 0

P-Reviewer: Kleinschmidt S, Germany; Terceno M, Spain

Received: June 22, 2022

Peer-review started: June 22, 2022

First decision: July 13, 2022

Revised: July 27, 2022

Accepted: October 20, 2022

Article in press: October 20, 2022

Published online: November 26, 2022



Yu Wang, Ding-Mu Wang, Quan-Tang Bao, Bei-Bei Wang, Shu-Jun Zhu, Department of Anesthesia, Xinghua City People's Hospital, Xinghua 225700, Jiangsu Province, China

Yi Yang, Department of Anesthesiology, Suzhou High-Tech Zone People's Hospital, Suzhou 215011, Jiangsu Province, China

Jie Li, Naval Medical Center, Naval Medical University, PLA, Shanghai 200433, China

Lu Zou, Department of Anesthesiology, Changzhou Hospital of Traditional Chinese Medicine, Changzhou 213000, Jiangsu Province, China

Corresponding author: Lu Zou, MD, Associate Chief Physician, Chief Doctor, Department of Anesthesiology, Changzhou Hospital of Traditional Chinese Medicine, No. 25 Heping North Road, Tianning District, Changzhou 213000, Jiangsu Province, China.

baobao01013812@163.com

Abstract

BACKGROUND

Mechanical ventilation can lead to the severe impairment of the metabolic pathway of alveolar surfactants, inactivating alveolar surfactants and significantly reducing lung-chest compliance. The cardiopulmonary function of elderly patients usually reduced to a certain extent, and there are lung complications after surgical anesthesia, just like lung barotrauma caused by mechanical ventilation, atelectasis and postoperative hypoxemia.

AIM

To investigate the effects of different positive end expiratory pressures (PEEPs) and tidal volumes (VTs) on respiratory function, the degree of the inflammatory response and hemodynamic indexes in patients undergoing surgery under general anesthesia.

METHODS

A total of 120 patients undergoing surgery for gastric or colon cancer under general anesthesia in Xinghua People's Hospital from January 2017 to January 2021 were randomly divided into Group A and Group B, with 60 cases in each group. The ventilation mode in Group A was VT (6.0 mL/kg) + PEEP (5.0 cmH₂O).

O), while that in Group B was VT (6.0 mL/kg) + PEEP (8.0 cmH₂O). Blood gas parameters, respiratory mechanical parameters, inflammatory response indicators, hemodynamic indicators and related complications were compared between the two groups.

RESULTS

There were no significant differences in PaCO₂, PaO₂, oxygen or the examined indexes at T0 between group A and group B ($P > 0.05$). The measured PaO₂ value of patients in group A at T3 was higher than that in group B, and the difference was significant ($P < 0.05$). There were no significant differences in peak airway pressure (P_{peak}), mean airway pressure or dynamic pulmonary compliance (C_{dyn}) at T0 between group A and group B ($P > 0.05$). The measured P_{peak} value of patients in group A at T1 was higher than that in group B, and the difference was significant ($P < 0.05$). The measured C_{dyn} value at T1 and T2 was greater than that in group B ($P < 0.05$). Before surgery, there were no significant differences in tumor necrosis factor- α (TNF- α), interleukin (IL)-6 or IL-10 between group A and group B ($P > 0.05$). After 4 h, the measured values of TNF- α and IL-6 in group A were lower than those in group B, and the differences were significant ($P < 0.05$). The IL-10 Level in group A was higher than that in group B ($P < 0.05$). At T0, there were no significant differences in cardiac output, cardiac index (CI), stroke volume index (SVI) or mean arterial pressure between group A and group B ($P > 0.05$). The measured values of CI and SVI at T2 in patients in group A were higher than those in group B, and the differences were significant ($P < 0.05$).

CONCLUSION

For patients undergoing surgery for gastric or colon cancer under general anesthesia, the VT (6.0 mL/kg) + PEEP (5.0 cmH₂O) regimen was more effective than the VT (6.0 mL/kg) + PEEP (8.0 cmH₂O) regimen in protecting the lung function and ventilatory function of patients, and it had better effects on maintaining hemodynamic stability and reducing inflammatory reactions.

Key Words: General anesthesia; Positive end expiratory pressure; Tidal volume; Respiratory function; Inflammatory reactions; Hemodynamics

©The Author(s) 2022. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: A retrospective study proved that for patients undergoing surgery for gastric or colon cancer under general anesthesia, the tidal volume (VT) (6.0 mL/kg) + positive end expiratory pressure (PEEP) (5.0 cmH₂O) regimen is better than the VT (6.0 mL/kg) + PEEP (8.0 cmH₂O) regimen. Can more effectively protect the patient's lung function and ventilation function.

Citation: Wang Y, Yang Y, Wang DM, Li J, Bao QT, Wang BB, Zhu SJ, Zou L. Different positive end expiratory pressure and tidal volume controls on lung protection and inflammatory factors during surgical anesthesia. *World J Clin Cases* 2022; 10(33): 12146-12155

URL: <https://www.wjgnet.com/2307-8960/full/v10/i33/12146.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v10.i33.12146>

INTRODUCTION

Elderly patients often present more complications because they exhibit a variety of pathologies during the perioperative period, such as decreased respiratory function and increased heterogeneity of lung tissue[1]. They are also prone to the development of lung injury, including barotrauma, atelectasis, postoperative hypoxemia and other complications during general anesthesia[2,3]. In addition, pulmonary complications are one of the main complications in elderly patients after general anesthesia [4]. Mechanical ventilation, as an important measure for respiratory support treatment and general anesthesia for surgery, has been used for a long time in clinical practice[5,6]. Some studies have proposed the use of low volume tidal (VT) (6–8 mL/kg) combined with a certain level of positive end expiratory pressure (PEEP) and allowing PaCO₂ to rise to a certain extent as a lung protection strategy, which can improve lung compliance and oxygenation function[7,8]. For example, applying VT supplemented with appropriate PEEP for mechanical ventilation during esophageal cancer surgery can reduce the systemic inflammatory response, improve lung function and shorten the time to extubation, indicating a certain improvement in the prognosis of patients[9]. A large number of studies confirmed that during mechanical ventilation, the alveolar epithelium was stimulated by mechanical traction and

released a variety of inflammatory cytokines, such as tumor necrosis factor- α (TNF- α), interleukin-6 (IL-6) and IL-10, which promoted the activation of macrophages and neutrophils. These cells not only produced a large amount of collagenase and elastase but also release a large amount of active oxygen. These substances can directly or indirectly destroy alveolar epithelial cells or even vascular endothelial cells, leading to lung tissue damage[7,10,11].

Reducing lung complications after surgery for gastric cancer or colon cancer under general anesthesia is an urgent problem to be solved. Research has shown[12] that PEEP can improve the oxygenation function of the lung to a certain extent and improve the ventilation effect. PEEP has been widely used in the treatment of acute lung injury and has achieved good clinical effects[3,13]. In this study, elderly patients (aged 60–81) undergoing abdominal tumor surgery under general anesthesia were taken as the research subjects, and the clinical effects of different ventilation modes were explored from a new perspective through comparisons among different groups to provide a theoretical and experimental basis for the safe implementation of mechanical ventilation in elderly patients.

MATERIALS AND METHODS

Material

A total of 120 patients undergoing surgery for gastric cancer or colon cancer under general anesthesia in our Hospital from January 2017 to January 2021 were selected and randomly divided into Group A and Group B, with 60 cases in each group according to random numbers. Inclusion criteria: (1) The patient had surgical treatment for gastric cancer or colon cancer under general anesthesia; (2) American Association of Anesthesiologists[14] classification: grades I–III; (3) The age of the patient was 60–81 years old; and (4) Presurgical lung function and heart function were tested, and the patient could tolerate the surgery. The exclusion criteria were as follows: (1) Concomitant bronchial asthma; (2) Pulmonary infection, tuberculosis and pulmonary fibrosis; (3) A history of congenital heart disease, severe arrhythmia and myocardial infarction; (4) A history of cerebrovascular disease in the past six months; (5) Allergic history; and (6) Other serious complications or complications.

Patients and their families received appropriate communication, and an informed consent form was signed by each patient before enrollment in this study. This study was implemented based on the protocols of the Medical Ethics Committee of our hospital.

Pharmaceutical instrument

Anesthetic drugs were given as follows: Midazolam: 10 mg/2 mL, Jiangsu Enhua Pharmaceutical Co., Ltd.; Propofol injection: 20 mL 200 mg, AstraZeneca Pharmaceutical Co., Ltd.; Intravenous neostigmine: 1 mL: 0.5 mg $\times$ 10 PCs, Henan Runhong Pharmaceutical Co., Ltd.; Etomidate fat emulsion 20 mg/10 mL, Jiangsu Enhua Pharmaceutical Co., Ltd.; Sevoflurane 250 mL/bottle, Maronite Pharmaceutical Co., Ltd.; Vecuronium bromide powder batch number: 1104012, 4 mg, manufacturer: Hainan Starr Pharmaceutical Co., Ltd.; and Fentanyl: 50 μ g/1 mL, Yichang Renfu Pharmaceutical Co., Ltd.

Instrument reagent

ELISA kits were purchased from Beijing Dakota Biotechnology Co., Ltd.; a microplate reader was used (model ELX-800) manufacturer: Burt Co., Ltd., USA; OMEDA 7100 (Shanghai Lixin Industry Co., Ltd.), an anesthesia machine was used, and Philips ECG Monitor (Philips Medical Instruments, the Netherlands) was used.

Anesthesia and ventilation methods

Surgical anesthesiologists were all doctors in the same group. Food and water was withheld from patients for more than 8 h before the operation. The venous channel was opened after entering the room, and ECG monitoring was conducted. An intravenous injection of 0.02 mg/kg midazolam was performed, and a right femoral artery puncture was performed under local anesthesia. Anesthesia was performed with an induced oxygen flow of 5 L/min, midazolam 0.01–0.03 mg/kg, propofol 2 mg/kg, and vecuronium 0.15 mg/kg. Intubation was performed successfully and the rats were mounted on the anesthesia machine. The ventilation mode in group A was VT (6.0 mL/kg) + PEEP (5.0 cmH₂O), while that in group B was VT (6.0 mL/kg) + PEEP (8.0 cmH₂O). End-expiratory carbon dioxide was maintained at 35–45 mmHg (1 mmHg = 0.133 kPa) during the operation, with a maximum airway pressure peak of no more than 25 cmH₂O. Before the operation, intravenous fentanyl at 2 μ g/kg and propofol at 3 mg/ (kg $\cdot$ h) were administered to maintain anesthesia, remifentanyl was administered at 0.05–1.00 μ g/ (kg $\cdot$ min), and intermittent vecuronium bromide injections and inhaled sevoflurane at a 0.5–1.2 minimum alveolar concentration were given. Inhalation anesthesia was stopped 20 min before the end of the operation, with an oxygen flow rate of 5 L/min and intravenous fentanyl at 0.5–1.0 μ g/kg. Spontaneous breathing resumed after surgery.

Observation index

The blood gas parameters, respiratory mechanical parameters, inflammatory response indicators, hemodynamic indicators and related complications of the two groups at different times [before anesthesia induction (T0), 10 min mechanical ventilation (T1), 60 min mechanical ventilation (T2), and after catheter removal (T3)] were compared.

The blood gas parameters mainly included arterial partial pressure of carbon dioxide (PaCO_2), arterial partial pressure of oxygen (PaO_2), oxygen and index. The respiratory mechanical parameters mainly included peak airway pressure (P_{peak}), mean airway pressure (P_{mean}), and dynamic pulmonary compliance (C_{dyn}).

Inflammatory response indicators included serum TNF- α , IL-6, and IL-10.

Hemodynamic indicators mainly included the patient's cardiac output (CO), cardiac index (CI), stroke volume index (SVI), and mean arterial pressure (MAP).

At different times during the operation, 3 mL of venous blood was collected and centrifuged at 3000 r/min for 15 min. Serum was separated, and the levels of TNF- α , IL-6 and IL-10 were detected by ELISA.

During the operation, a multifunctional monitor was used to record the P_{peak} , C_{dyn} , P_{mean} , MAP, CO, SVI, and CI. Arterial blood was drawn for blood gas analysis, PaO_2 and PaCO_2 were recorded, and the oxygenation index (OI) was calculated, where $\text{OI} = \text{PaO}_2 / \text{FiO}_2$.

Statistical analysis

In this study, the measurement values of P_{peak} , P_{mean} and C_{dyn} were all in line with the approximate normal distribution or normal distribution through the normal distribution test, expressed as mean $\pm$ SD, and the measurement data were analyzed by the *t* test and an analysis of variance in SPSS software. The χ^2 test was used to analyze adverse reactions. The significance level was set at $\alpha = 0.05$.

RESULTS

Comparison of general data between two groups

There were no significant differences in baseline data, such as age, height, weight, and sex composition, between group A and group B ($P > 0.05$, Table 1).

Comparison of operation indexes between two groups

There were no significant differences in operation time, anesthesia time, total fluid replacement or urine volume between group A and group B ($P > 0.05$, Table 2).

Comparison of blood gas index between two groups

There were no significant differences in PaCO_2 , PaO_2 , oxygen or index at T0 between group A and group B ($P > 0.05$). The measured PaO_2 value of patients in group A at T3 was higher than that in group B, and the difference was significant ($P < 0.05$, Table 3).

Comparison of airway compliance between two groups

Compared with group A and group B at T0, there was no significant difference ($P > 0.05$). The measured value of P_{peak} in group A was higher than that in group B at T1 ($P < 0.05$), and the measured value of C_{dyn} at T1 and T2 was higher than that in group B ($P < 0.05$) (Table 4).

Comparison of serum inflammatory factor levels before and after the operation between the two groups

Before surgery, there were no significant differences in TNF- α , IL-6 or IL-10 between group A and group B ($P > 0.05$). After 4 h, the measured values of TNF- α and IL-6 in group A were lower than those in group B, and the differences were significant ($P < 0.05$). The IL-10 Level in group A was higher than that in group B ($P < 0.05$) (Table 5).

Comparison of hemodynamic indexes before and after operation between the two groups

At T0, there were no significant differences in CO, CI, SVI or MAP between group A and group B ($P > 0.05$). The measured values of CI and SVI at T2 in group A were higher than those in group B, and the differences were significant ($P < 0.05$) (Table 6).

Comparison of complication rate between two groups

The incidence of surgical complications in group A and group B was statistically analyzed, and there were no significant differences between the two groups ($P > 0.05$, Table 7).

Table 1 Comparison of general data of the two groups of patients (mean $\pm$ SD)

Index	Group A (n = 60)	Group B (n = 60)	t/ χ^2 value	P value
Age (yr)	69.6 $\pm$ 5.3	70.3 $\pm$ 5.7	-0.697	0.487
Height (cm)	165.0 $\pm$ 6.1	163.9 $\pm$ 5.5	1.037	0.302
Body weight (kg)	125.1 $\pm$ 9.7	126.4 $\pm$ 7.5	-0.821	0.413
SBP (mmHg)	129.5 $\pm$ 7.6	128.0 $\pm$ 8.2	1.039	0.301
DBP (mmHg)	75.2 $\pm$ 6.9	76.8 $\pm$ 7.7	-1.199	0.233
HR (beats/min)	76.4 $\pm$ 8.1	75.0 $\pm$ 7.0	1.013	0.313
Sex, n (%)			0.862	0.353
Male	33 (55.00)	38 (63.33)		
Female	27 (45.00)	22 (36.67)		
hypertension, n (%)			1.269	0.260
Yes	26 (43.33)	20 (33.33)		
No	34 (56.67)	40 (66.67)		
Diabetes, n (%)			1.713	0.191
Yes	11 (18.33)	6 (10.00)		
No	49 (81.67)	54 (90.00)		
ASA stage, n (%)			2.874	0.238
I stage	15 (25.00)	10 (16.67)		
II stage	35 (58.33)	33 (55.00)		
III stage	10 (16.67)	17 (28.33)		

SBP: Systolic blood pressure; DBP: Diastolic blood pressure; HR: Heart rate; ASA: American Society of Anesthesiologists.

Table 2 Comparison of surgical indicators between the two groups (mean $\pm$ SD)

Group	Operation time (min)	Anesthesia time (min)	Total rehydration (mL)	Urine volume (mL)
Group A (n = 60)	216.3 $\pm$ 20.5	233.8 $\pm$ 19.5	2568.1 $\pm$ 208.4	398.5 $\pm$ 58.1
Group B (n = 60)	212.0 $\pm$ 22.7	229.5 $\pm$ 22.8	2590.4 $\pm$ 211.7	410.3 $\pm$ 63.5
t value	1.089	1.110	-0.581	-1.062
P value	0.278	0.269	0.562	0.290

Table 3 Comparison of surgical indicators between the two groups (mean $\pm$ SD)

Group	Operation time (min)	Anesthesia time (min)	Total rehydration (mL)	Urine volume (mL)
Group A (n = 60)	216.3 $\pm$ 20.5	233.8 $\pm$ 19.5	2568.1 $\pm$ 208.4	398.5 $\pm$ 58.1
Group B (n = 60)	212.0 $\pm$ 22.7	229.5 $\pm$ 22.8	2590.4 $\pm$ 211.7	410.3 $\pm$ 63.5
t value	1.089	1.110	-0.581	-1.062
P value	0.278	0.269	0.562	0.290

DISCUSSION

In elderly patients, the alveoli are more likely to collapse during general anesthesia, causing atelectasis and leading to lung injury and hypoxemia. Small tidal volume combined with PEEP has been widely used in the clinical treatment of acute lung injury and has achieved good clinical results. However, with the increase in PEEP, the venous return flow may be decreased, and the arterial vascular resistance will be increased, which may affect cardiac output and increase the risk of lung injury, especially for elderly

Table 4 Comparison of airway compliance indexes between the two groups (mean $\pm$ SD)

Group	T0	T1	T2	T3
P_{peak} (cmH₂O)				
Group A (n = 60)	15.36 $\pm$ 2.44	20.06 $\pm$ 1.98	21.58 $\pm$ 2.74	17.41 $\pm$ 2.80
Group B (n = 60)	16.11 $\pm$ 2.70	18.62 $\pm$ 2.70	20.67 $\pm$ 2.68	18.15 $\pm$ 2.76
t value	-1.596	3.331	1.839	-1.458
P value	0.113	0.001	0.068	0.148
P_{mean} (cmH₂O)				
Group A (n = 60)	8.51 $\pm$ 1.84	10.33 $\pm$ 1.96	11.36 $\pm$ 2.24	10.71 $\pm$ 2.54
Group B (n = 60)	8.93 $\pm$ 2.00	9.81 $\pm$ 2.71	10.95 $\pm$ 2.46	10.40 $\pm$ 2.75
t value	-1.197	1.204	0.955	0.641
P value	0.234	0.231	0.342	0.522
Cdyn (cmH₂O)				
Group A (n = 60)	38.64 $\pm$ 3.11	30.52 $\pm$ 3.04	29.64 $\pm$ 3.11	33.75 $\pm$ 3.58
Group B (n = 60)	39.33 $\pm$ 4.05	28.64 $\pm$ 3.58	28.11 $\pm$ 2.90	32.68 $\pm$ 2.83
t value	-1.047	3.101	2.787	1.816
P value	0.297	0.002	0.006	0.072

P_{peak}: Peak airway pressure; P_{mean}: Mean airway pressure; Cdyn: Dynamic pulmonary compliance.

Table 5 Comparison of serum inflammatory factor levels before and after operation between the two groups (mean $\pm$ SD)

Group	TNF- α (ng/mL)		IL-6 (pg/mL)		IL-10 (pg/mL)	
	Preoperative	4 h after operation	Preoperative	4 h after operation	Preoperative	4 h after operation
Group A (n = 60)	43.26 $\pm$ 6.80	76.65 $\pm$ 8.77	47.14 $\pm$ 5.50	56.94 $\pm$ 7.30	34.62 $\pm$ 5.10	29.51 $\pm$ 4.75
Group B (n = 60)	45.10 $\pm$ 6.55	89.28 $\pm$ 12.64	45.03 $\pm$ 6.28	69.71 $\pm$ 10.38	36.36 $\pm$ 6.15	25.83 $\pm$ 5.08
t value	-1.510	-6.359	1.958	-7.795	-1.687	4.099
P value	0.134	0.000	0.053	0.000	0.094	0.000

TNF- α : Tumor necrosis factor- α ; IL: Interleukin.

patients under general anesthesia[15-17].

In this study, patients undergoing gastric or colon cancer surgery under general anesthesia were given different kinds of ventilation. The ventilation mode in group A was VT (6.0 mL/kg) + PEEP (5.0 cmH₂O), and that in group B was VT (6.0 mL/kg) + PEEP (8.0 cmH₂O). The results of this study showed that there were no significant differences in PaCO₂, PaO₂, oxygen or index at T0 between group A and group B ($P > 0.05$). The measured PaO₂ value of patients in group A at T3 was higher than that in group B, and the difference was significant. This study found that a small tidal volume of 6 mL/kg combined with PEEP 5 cmH₂O and 8 cmH₂O could improve alveolar oxygenation function. To a certain extent, PaO₂ increased with increasing PEEP, improving the oxygenation and ventilation function of the lung. The unventilated alveolar dead spaces would reopen, and the number would increase, leading to the corresponding enhancement of alveolar oxygenation function. PEEP is conducive to the exchange of external gas and alveolar gas, as well as the release of carbon dioxide and the entry of oxygen into the alveolar space, thus improving the oxygenation and ventilation function of the lung in elderly patients.

P_{peak}, P_{mean} and Cdyn are three commonly used respiratory mechanical indicators that can reflect lung compliance, airway resistance and alveolar pressure[18,19]. The results of this study showed that there were no significant differences in P_{peak}, P_{mean} and Cdyn at T0 between the patients in group A and group B ($P > 0.05$). The P_{peak} measured value of patients in group A at T1 was higher than that in group B, and the difference was significant ($P < 0.05$). The Cdyn measured value at T1 and T2 was greater than that in group B. In Group B, the 6 mL/kg tidal volume in combination with PEEP at 5 cmH₂O mode had a lower change in airway pressure and a lower P_{peak} and thus had less adverse effect on lung compliance,

Table 6 Comparison of hemodynamic indexes between two groups of patients before and after operation (mean $\pm$ SD)

Group	T0	T1	T2	T3
CO (L/min)				
Group A (<i>n</i> = 60)	4.81 $\pm$ 0.85	4.43 $\pm$ 0.80	4.36 $\pm$ 0.75	4.51 $\pm$ 0.83
Group B (<i>n</i> = 60)	4.95 $\pm$ 0.90	4.30 $\pm$ 0.78	4.13 $\pm$ 0.80	4.37 $\pm$ 0.86
<i>t</i> value	-0.876	0.901	1.625	0.907
<i>P</i> value	0.383	0.369	0.107	0.366
CI [L/(min m ²)]				
Group A (<i>n</i> = 60)	4.11 $\pm$ 0.40	3.83 $\pm$ 0.46	3.51 $\pm$ 0.42	3.68 $\pm$ 0.40
Group B (<i>n</i> = 60)	4.26 $\pm$ 0.44	3.90 $\pm$ 0.50	3.30 $\pm$ 0.39	3.53 $\pm$ 0.44
<i>t</i> value	-1.954	-0.798	2.838	1.954
<i>P</i> value	0.053	0.426	0.005	0.053
SVI (mL/m ²)				
Group A (<i>n</i> = 60)	47.52 $\pm$ 4.63	44.03 $\pm$ 3.75	43.85 $\pm$ 3.11	45.08 $\pm$ 4.09
Group B (<i>n</i> = 60)	48.36 $\pm$ 4.90	43.41 $\pm$ 4.03	41.66 $\pm$ 3.57	44.13 $\pm$ 4.37
<i>t</i> value	-0.965	0.872	3.583	1.229
<i>P</i> value	0.336	0.385	0.000	0.221
MAP (mmHg)				
Group A (<i>n</i> = 60)	97.63 $\pm$ 4.15	88.16 $\pm$ 5.20	87.11 $\pm$ 4.64	102.84 $\pm$ 5.00
Group B (<i>n</i> = 60)	98.90 $\pm$ 4.68	86.85 $\pm$ 4.96	86.08 $\pm$ 5.03	104.07 $\pm$ 4.86
<i>t</i> value	-1.573	1.412	1.166	-1.366
<i>P</i> value	0.118	0.161	0.246	0.174

CO: Cardiac output; CI: Cardiac index; SVI: Stroke volume index; MAP: Mean arterial pressure.

Table 7 Comparison of the complication rate between the two groups

Group	Lung infection	Atelectasis	Other	Complication rate (%)
Group A (<i>n</i> = 60)	2	0	1	3 (5.00)
Group B (<i>n</i> = 60)	3	1	3	7 (11.67)
χ^2 value				1.745
<i>P</i> value				0.186

suggesting an improved lung protection and more advantages especially in patients with low lung compliance. In this study, it was also found that the measured Cdyn value at T1 and T2 was greater than that in group B, which might be due to the decrease in lung compliance caused by the increase in long-term airway pressure in patients during the operation mode. The mode in group B was conducive to the protection of the lung, and it could avoid lung injury caused by high tidal volume. The lung functions of different patients are different, and the PEEP that causes the reopening of collapsed alveoli is also different. When setting the PEEP, we need to evaluate its clinical effect and the impact of adverse consequences on patients and then make the corresponding parameter settings to achieve the best effect and minimize adverse reactions. When the PEEP exceeds a certain range, the probability of lung injury will increase. However, further research is needed.

The results of this study showed that the CI and SVI measured values of patients in group A at T2 were higher than those in group B, and the differences were significant. A tidal volume of 6 mL/kg combined with a PEEP of 5 cmH₂O improved intrathoracic and right atrial pressure, reduced left ventricular transmural systolic blood pressure and pressure gradient, reduced intrathoracic blood volume and extravascular lung water, and improved hemodynamics. Setting appropriate PEEP could improve cardiac function and alleviate pulmonary edema. In this study, a tidal volume of 6 mL/kg combined with a PEEP of 5 cmH₂O ventilation mode was more conducive to the stability of body

hemodynamics.

With the clinical benefits of low tidal volume combined with an appropriate level of PEEP-based lung protective ventilation strategy in patients undergoing mechanical ventilation during major surgery, anesthesiologists began to explore and find lung protective ventilation strategies that could be applied during mechanical ventilation during general anesthesia. Studies have shown that a small tidal volume combined with an appropriate level of PEEP ventilation can inhibit the release of inflammatory cytokines. There are few reports regarding the effects of different mechanical ventilation modes on inflammatory cytokines in elderly patients undergoing gastric or colon cancer surgery under general anesthesia. Once inflammatory factors are out of balance, they will lead to serious adverse consequences. IL-10 is an anti-inflammatory and immunosuppressive factor that inhibits the release of proinflammatory mediators such as IL-6 and TNF- α [20]. The results of this study showed that at 4 h after surgery, the measured values of TNF- α and IL-6 in group A were lower than those in group B, and the differences were significant ($P < 0.05$). The IL-10 Level in group A was higher than that in group B ($P < 0.05$). The results of blood gas indicators showed that the use of a tidal volume of 6 mL/kg combined with the PEEP 5 cmH₂O mode of mechanical ventilation in elderly patients with gastric or colon cancer under general anesthesia had less impact on inflammatory factors and blood gas indicators in elderly patients, and the incidence of postoperative lung injury was also low.

Clinically, it has been concluded in recent years that the ventilation mode of low VT, a certain level of PEEP and permissive hypercapnia is mainly used for the treatment of acute lung injury, acute respiratory distress syndrome and other causes leading to respiratory failure. This study focused on the effects of different mechanical ventilation modes on the prognosis of elderly patients with gastric cancer and gastric or colon cancer.

CONCLUSION

In summary, the VT (6.0 mL/kg) + PEEP (5.0 cmH₂O) scheme is more effective than the VT (6.0 mL/kg) + PEEP (8.0 cmH₂O) scheme in protecting the lung function and ventilatory function of patients undergoing surgery for gastric cancer or colon cancer under general anesthesia, and it has better effects on maintaining hemodynamic stability and reducing inflammatory reactions.

ARTICLE HIGHLIGHTS

Research background

Mechanical ventilation can lead to the severe impairment of the metabolic pathway of alveolar surfactants, inactivating alveolar surfactants and significantly reducing lung-chest compliance. The cardiopulmonary function of elderly patients usually reduced to a certain extent, and there are lung complications after surgical anesthesia, just like lung barotrauma caused by mechanical ventilation, atelectasis and postoperative hypoxemia.

Research motivation

This study investigated the effects of different positive end expiratory pressures (PEEPs) and tidal volumes (VTs) on respiratory function, the degree of the inflammatory response and hemodynamic indexes in patients undergoing surgery under general anesthesia.

Research objectives

This research aimed to explore the effects of different PEEP and VT control on lung protection and inflammatory factors during surgical anesthesia

Research methods

A total of 120 patients undergoing surgery for gastric or colon cancer under general anesthesia in Xinghua People's Hospital from January 2017 to January 2021 were included.

Research results

There were no significant differences in PaCO₂, PaO₂, oxygen or the examined indexes at T0 between group A and group B. The measured PaO₂ value of patients in group A at T3 was higher than that in group B, and the difference was significant. The measured peak airway pressure value of patients in group A at T1 was higher than that in group B, and the difference was significant. The measured dynamic pulmonary compliance value at T1 and T2 was greater than that in group B).

Research conclusions

For patients undergoing surgery for gastric or colon cancer under general anesthesia, the VT (6.0

mL/kg) + PEEP (5.0 cmH₂O) regimen was more effective than the VT (6.0 mL/kg) + PEEP (8.0 cmH₂O) regimen in protecting the lung function and ventilatory function of patients, and it had better effects on maintaining hemodynamic stability and reducing inflammatory reactions.

Research perspectives

For patients undergoing gastric or colon cancer surgery under general anesthesia, the VT (6.0 mL/kg) + PEEP (5.0 cmH₂O) regimen is more valuable in clinical promotion than the VT (6.0 mL/kg) + PEEP (8.0 cmH₂O) regimen.

FOOTNOTES

Author contributions: Wang Y and Yang Y have the same contribution to this article and should be regarded as the co-first author; Wang Y, Yang Y and Wang DM design the experiment; Li J drafted the work, Bao QT, Wang BB and Zhu SJ collected the data; Yang Y, Zou L and Wang Y analysed and interpreted data, Wang Y, Yang Y, Wang DM and Li J wrote the article.

Institutional review board statement: This study was approved by the Medical Ethics Committee of Xinghua City People's Hospital.

Informed consent statement: Patients were not required to give informed consent to the study because the analysis used anonymous clinical data that were obtained after each patient agreed to treatment by written consent.

Conflict-of-interest statement: The authors declared that there is no conflict of interest between them.

Data sharing statement: No additional data are available.

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>

Country/Territory of origin: China

ORCID number: Yu Wang 0000-0003-2262-882X; Yi Yang 0000-0002-7937-9951; Ding-Mu Wang 0000-0003-0361-4713; Jie Li 0000-0002-6396-1007; Quan-Tang Bao 0000-0002-9376-1962; Bei-Bei Wang 0000-0002-9965-9344; Shu-Jun Zhu 0000-0001-7147-0016; Lu Zou 0000-0002-4176-5443.

S-Editor: Wang JL

L-Editor: A

P-Editor: Wang JL

REFERENCES

- 1 Aceto P, Perilli V, Luca E, Schipa C, Calabrese C, Fortunato G, Marusco I, Lai C, Sollazzi L. Predictive power of modified frailty index score for pulmonary complications after major abdominal surgery in the elderly: a single centre prospective cohort study. *Eur Rev Med Pharmacol Sci* 2021; **25**: 3798-3802 [PMID: 34109588 DOI: 10.26355/eurrev_202105_25947]
- 2 You AH, Song Y, Kim DH, Suh J, Baek JW, Han DW. Effects of positive end-expiratory pressure on intraocular pressure and optic nerve sheath diameter in robot-assisted laparoscopic radical prostatectomy: A randomized, clinical trial. *Medicine (Baltimore)* 2019; **98**: e15051 [PMID: 30946349 DOI: 10.1097/MD.00000000000015051]
- 3 Turbil E, Terzi N, Cour M, Argaud L, Einav S, Guérin C. Positive end-expiratory pressure-induced recruited lung volume measured by volume-pressure curves in acute respiratory distress syndrome: a physiologic systematic review and meta-analysis. *Intensive Care Med* 2020; **46**: 2212-2225 [PMID: 32915255 DOI: 10.1007/s00134-020-06226-9]
- 4 Génèreux V, Chassé M, Girard F, Massicotte N, Chartrand-Lefebvre C, Girard M. Effects of positive end-expiratory pressure/recruitment manoeuvres compared with zero end-expiratory pressure on atelectasis during open gynaecological surgery as assessed by ultrasonography: a randomised controlled trial. *Br J Anaesth* 2020; **124**: 101-109 [PMID: 31733807 DOI: 10.1016/j.bja.2019.09.040]
- 5 Frutos-Vivar F, Peñuelas O, Muriel A, Mancebo J, García-Jiménez A, de Pablo R, Villedor M, Ferrer M, León M, Quiroga JM, Temprano S, Vallverdú I, Fernández R, Gordo F, Anzueto A, Esteban A. Mechanical ventilation in Spain, 1998-2016: changes in the disconnection of mechanical ventilation. *Med Intensiva (Engl Ed)* 2021 [PMID: 34092422 DOI: 10.1016/j.medint.2021.04.005]
- 6 Forrest IS, Jaladanki SK, Paranjpe I, Glicksberg BS, Nadkarni GN, Do R. Non-invasive ventilation versus mechanical ventilation in hypoxemic patients with COVID-19. *Infection* 2021; **49**: 989-997 [PMID: 34089483 DOI: 10.1007/s15010-021-01633-6]

- 7 **Mazzinari G**, Diaz-Cambronero O, Alonso-Iñigo JM, Garcia-Gregorio N, Ayas-Montero B, Ibañez JL, Serpa Neto A, Ball L, Gama de Abreu M, Pelosi P, Maupoey J, Argente Navarro MP, Schultz MJ. Intraabdominal Pressure Targeted Positive End-expiratory Pressure during Laparoscopic Surgery: An Open-label, Nonrandomized, Crossover, Clinical Trial. *Anesthesiology* 2020; **132**: 667-677 [PMID: [32011334](#) DOI: [10.1097/ALN.0000000000003146](#)]
- 8 **Collino F**, Rapetti F, Vasques F, Maiolo G, Tonetti T, Romitti F, Niewenhuys J, Behnemann T, Camporota L, Hahn G, Reupke V, Holke K, Herrmann P, Duscio E, Cipulli F, Moerer O, Marini JJ, Quintel M, Gattinoni L. Positive End-expiratory Pressure and Mechanical Power. *Anesthesiology* 2019; **130**: 119-130 [PMID: [30277932](#) DOI: [10.1097/ALN.0000000000002458](#)]
- 9 **Kiss T**, Bluth T, Braune A, Huhle R, Denz A, Herzog M, Herold J, Vivona L, Millone M, Bergamaschi A, Andreeff M, Scharffenberg M, Wittenstein J, Vidal Melo MF, Koch T, Rocco PRM, Pelosi P, Kotzerke J, Gama de Abreu M. Effects of Positive End-Expiratory Pressure and Spontaneous Breathing Activity on Regional Lung Inflammation in Experimental Acute Respiratory Distress Syndrome. *Crit Care Med* 2019; **47**: e358-e365 [PMID: [30676338](#) DOI: [10.1097/CCM.0000000000003649](#)]
- 10 **Hol L**, Nijbroek SGLH, Schultz MJ. Perioperative Lung Protection: Clinical Implications. *Anesth Analg* 2020; **131**: 1721-1729 [PMID: [33186160](#) DOI: [10.1213/ANE.0000000000005187](#)]
- 11 **Scaramuzzo G**, Spadaro S, Dalla Corte F, Waldmann AD, Böhm SH, Ragazzi R, Marangoni E, Grasselli G, Pesenti A, Volta CA, Mauri T. Personalized Positive End-Expiratory Pressure in Acute Respiratory Distress Syndrome: Comparison Between Optimal Distribution of Regional Ventilation and Positive Transpulmonary Pressure. *Crit Care Med* 2020; **48**: 1148-1156 [PMID: [32697485](#) DOI: [10.1097/CCM.0000000000004439](#)]
- 12 **Yoshida T**, Grieco DL, Brochard L, Fujino Y. Patient self-inflicted lung injury and positive end-expiratory pressure for safe spontaneous breathing. *Curr Opin Crit Care* 2020; **26**: 59-65 [PMID: [31815775](#) DOI: [10.1097/MCC.0000000000000691](#)]
- 13 **Priebe HJ**. Effect of intraoperative PEEP and recruitment manoeuvres on postoperative lung aeration. Comment on Br J Anaesth 2020; **124**: 101-109. *Br J Anaesth* 2020; **125**: e234-e235 [PMID: [32354413](#) DOI: [10.1016/j.bja.2020.03.023](#)]
- 14 **Spadaro S**, Caramori G, Rizzuto C, Mojoli F, Zani G, Ragazzi R, Valpiani G, Dalla Corte F, Marangoni E, Volta CA. Expiratory Flow Limitation as a Risk Factor for Pulmonary Complications After Major Abdominal Surgery. *Anesth Analg* 2017; **124**: 524-530 [PMID: [27537927](#) DOI: [10.1213/ANE.0000000000001424](#)]
- 15 **Amaral BLR**, de Figueiredo AB, Lorena DM, Oliveira ACO, Carvalho NC, Volpe MS. Effects of ventilation mode and manual chest compression on flow bias during the positive end- and zero end-expiratory pressure manoeuvre in mechanically ventilated patients: a randomised crossover trial. *Physiotherapy* 2020; **106**: 145-153 [PMID: [30979507](#) DOI: [10.1016/j.physio.2018.12.007](#)]
- 16 **Lee JH**, Ji SH, Lee HC, Jang YE, Kim EH, Kim HS, Kim JT. Evaluation of the intratidal compliance profile at different PEEP levels in children with healthy lungs: a prospective, crossover study. *Br J Anaesth* 2020; **125**: 818-825 [PMID: [32682552](#) DOI: [10.1016/j.bja.2020.06.046](#)]
- 17 **Ilia S**, Geromarkaki E, Briassoulis P, Bourmpaki P, Tavladaki T, Miliaraki M, Briassoulis G. Effects of increasing PEEP on lung stress and strain in children with and without ARDS. *Intensive Care Med* 2019; **45**: 1315-1317 [PMID: [31214743](#) DOI: [10.1007/s00134-019-05667-1](#)]
- 18 **Shono A**, Katayama N, Fujihara T, Böhm SH, Waldmann AD, Ugata K, Nikai T, Saito Y. Positive End-expiratory Pressure and Distribution of Ventilation in Pneumoperitoneum Combined with Steep Trendelenburg Position. *Anesthesiology* 2020; **132**: 476-490 [PMID: [31770148](#) DOI: [10.1097/ALN.0000000000003062](#)]
- 19 **Mini G**, Ray BR, Anand RK, Muthiah T, Baidya DK, Rewari V, Sahni P, Maitra S. Effect of driving pressure-guided positive end-expiratory pressure (PEEP) titration on postoperative lung atelectasis in adult patients undergoing elective major abdominal surgery: A randomized controlled trial. *Surgery* 2021; **170**: 277-283 [PMID: [33771357](#) DOI: [10.1016/j.surg.2021.01.047](#)]
- 20 **Reinius H**, Borges JB, Engström J, Ahlgren O, Lennmyr F, Larsson A, Fredén F. Optimal PEEP during one-lung ventilation with capnotherax: An experimental study. *Acta Anaesthesiol Scand* 2019; **63**: 222-231 [PMID: [30132806](#) DOI: [10.1111/aas.13247](#)]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

Telephone: +1-925-3991568

E-mail: bpgoffice@wjgnet.com

Help Desk: <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

