



Scopus Preview

Source details

Annals of Medicine and Surgery

Scopus coverage years: from 2012 to Present

Publisher: Elsevier

E-ISSN: 2049-0801

Subject area: Medicine: Surgery

Source type: Journal

[View all documents >](#)[Set document alert](#)[Save to source list](#) [Source Homepage](#)CiteSc
1.4SJR 20
0.37SNIP 2
0.96[CiteScore](#) [CiteScore rank & trend](#) [Scopus content coverage](#)

i Improved CiteScore methodology

CiteScore 2021 counts the citations received in 2018-2021 to articles, reviews, conference papers, book chapters and data papers published in 2018-2021, and divides this by the number of publications published in 2018-2021. [Learn more >](#)

CiteScore 2021 ∨

$$1.4 = \frac{2,710 \text{ Citations } 2018 - 2021}{1,918 \text{ Documents } 2018 - 2021}$$

Calculated on 05 May, 2022

CiteScoreTracker 2022 ⓘ

$$1.3 = \frac{3,599 \text{ Citations to date}}{2,711 \text{ Documents to date}}$$

Last updated on 05 August, 2022 • Updated monthly

CiteScore rank 2021 ⓘ

Category	Rank	Percentile
Medicine		
└ Surgery	#266/469	43rd

[View CiteScore methodology >](#) [CiteScore FAQ >](#) [Add CiteScore to your site](#)

About Scopus

[What is Scopus](#)

[Content coverage](#)

[Scopus blog](#)

[Scopus API](#)

[Privacy matters](#)

Language

[日本語版を表示する](#)

[查看简体中文版本](#)

[查看繁體中文版本](#)

[Просмотр версии на русском языке](#)

Customer Service

[Help](#)

[Tutorials](#)

[Contact us](#)

ELSEVIER

[Terms and conditions](#) ↗ [Privacy policy](#) ↗

Copyright © [Elsevier B.V](#) ↗. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the [use of cookies](#) ↗.



also developed by scimago:



SCIMAGO INSTITUTIONS RANKINGS

SJR

Scimago Journal & Country Rank

Enter Journal Title, ISSN or Publisher Name

[Home](#)[Journal Rankings](#)[Country Rankings](#)[Viz Tools](#)[Help](#)[About Us](#)

international research journal


Peer review, Referred Journal

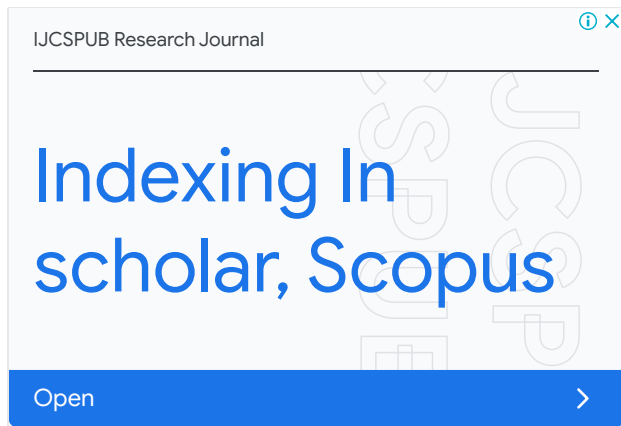
How to Publish Paper, free cost publication, ugc care journal policy follow

submit.tijer.org

OPEN


Annals of Medicine and Surgery

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	H-INDEX
<p>Netherlands</p> <p> Universities and research institutions in Netherlands</p>	<p>Medicine</p> <ul style="list-style-type: none"> Medicine (miscellaneous) Surgery 	<p>Elsevier BV</p>	<p>30</p>
PUBLICATION TYPE	ISSN	COVERAGE	INFORMATION
<p>Journals</p>	<p>20490801</p>	<p>2012-2021</p>	<p>Homepage</p> <p>How to publish in this journal</p> <p>annalsjournal@elsevier.com</p>



SCOPE

Annals of Medicine and Surgery is an online-only, peer-reviewed open access journal with a global outlook and focus on those training in medicine and surgery (postgraduate and undergraduate). AMS contains a mix of original clinical and basic science research, reviews, editorials, commentary, perspectives, debate, opinion, case reports and journal club reports. The journal crosses the whole disease spectrum of medicine and surgery but does also have a special focus on the following areas: -Patient safety- Human factors, teamwork, communication and professionalism- Quality improvement science and practice- Evidence based medicine- Implementation science – clinical evidence into practice- Leadership and management- Medical education, teaching, and training- Public and global health- Healthcare policy, delivery, commissioning, and resource management- Use of technology and health informatics- Clinical ethics and medical law- Research and innovation – bedside to bench and back again – including applications like personalised medicine.


 Join the conversation about this journal



submit paper for publication



IJSDR Research Journal

 Quartiles

 B



submit paper for publication



IJSDR Research Journal

FIND SIMILAR JOURNALS

1
International Journal of Surgery
NLD

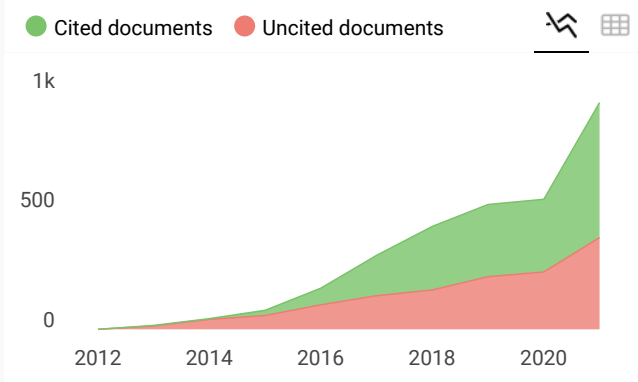
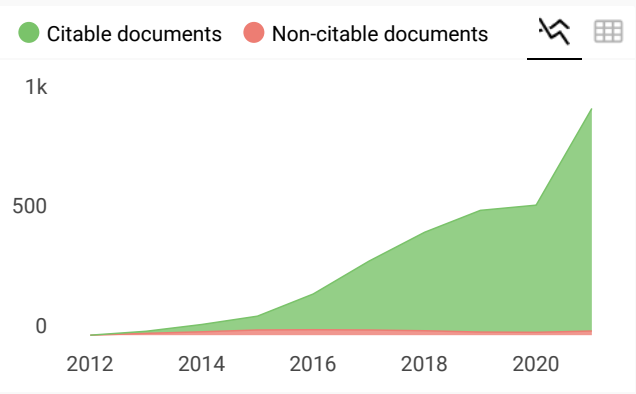
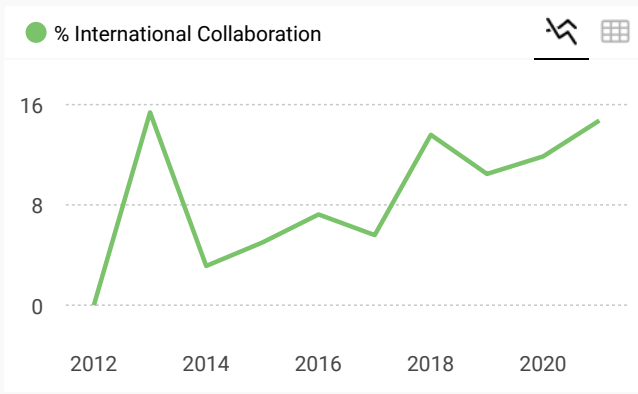
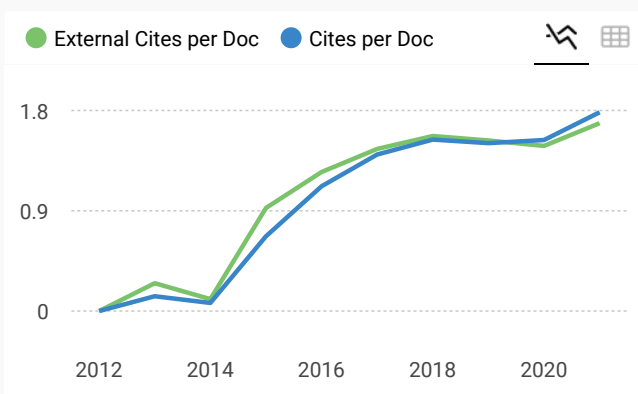
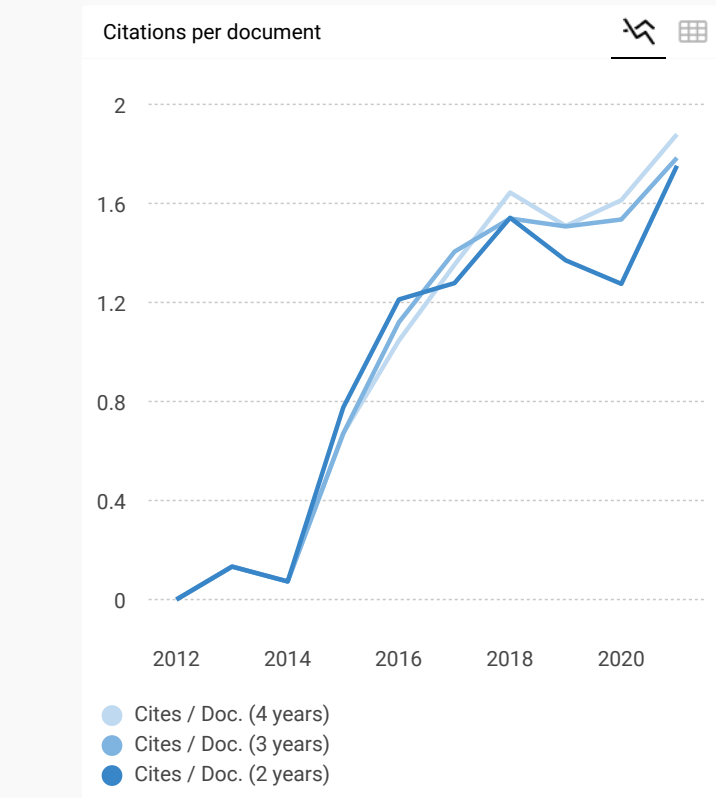
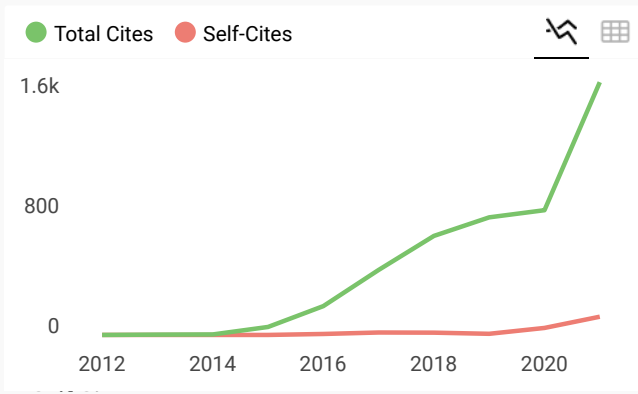
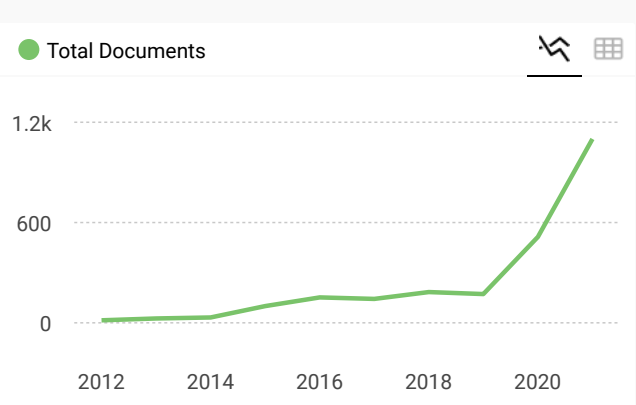
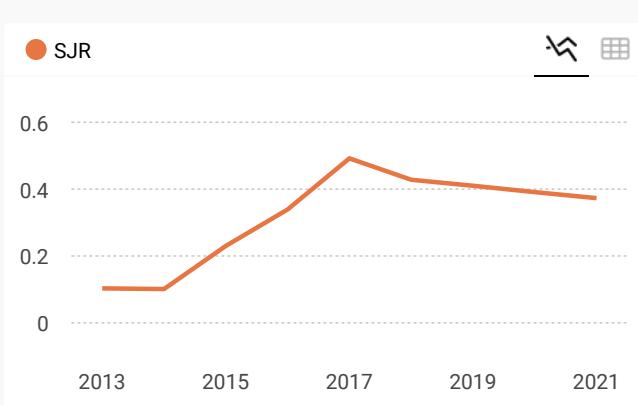
80%
similarity

2
International Journal of Surgery Open
GBR

73%
similarity

3
International Journal of Surgery Case Reports
NLD

67%
similarity



Annals of Medicine and Surgery

Q3 Medicine (miscellaneous) best quartile

SJR 2021 0.37

powered by scimagojr.com

← Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scimagojr.com/journalsearch.php?q=21100283772&tip=...">
```



ISSN 2089-0801

ANNALS OF MEDICINE & SURGERY



EDITIO • DILIGENTIA • FIDES

www.annalsjournal.com

ScienceDirect



ScienceDirect

Annals of Medicine and Surgery

Open access

1.4

CiteScore

Submit your article ↗

Guide for authors ↗

☰ Menu

🔍 Search in this journal

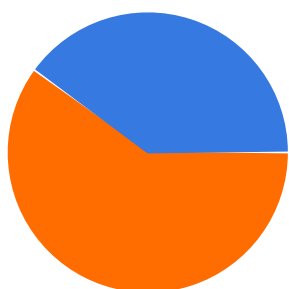
- Aims and scope
- **Editorial board**
- Abstracting & indexing
- News
- Announcements

FEEDBACK 

Gender diversity of editors

> More details

Based on 42.90% responding editors



● 60% man

● 40% woman

● 0% non-binary or gender diverse

● 0% prefer not to disclose

Editorial board

Editor-in-Chief

Riaz Agha, BSc, MBBS, M.Sc., D.Phil, FHEA, FRSA, FRSPH, FRCS, FRCS, FEBOPRAS

London, United Kingdom

Managing Editor

A.J. Fowler

London, United Kingdom

FEEDBACK 

Executive Editor

M. Agha

London, United Kingdom

Executive Committee

D. Rosin, MBBS, FRCS(edin) & FRCS (eng), MS

Bridgetown, Barbados

Professor Barry Jackson

London, United Kingdom

Statistical Editor

L.C. See

Taoyuan, Taiwan

Editorial Board

X-P. Chen

Wuhan, Hubei, China

M. Cohen

Newark, New Jersey, United States of America

D. Green

London, United Kingdom

S. Hamid

FEEDBACK 

Karachi, Pakistan

P. Hutchinson

Cambridge, United Kingdom

P. Littlejohns

London, United Kingdom

A. Mahapatra

Bhubaneswar, India

J. McKimm

Swansea, United Kingdom

D. Muzumdar

Mumbai, India

A.A. Nabar

Mumbai, India

F. Nicoli

London, United Kingdom

J. Norcini

Philadelphia, Pennsylvania, United States of America

D. Sokol

London, United Kingdom

FEEDBACK 

J. Talati

Karachi, Pakistan

J.V. Thomas

Birmingham, Alabama, United States of America

M. C. Warlé

Nijmegen, Netherlands

T.G. Williams

Tunbridge Wells, United Kingdom

Assistant Editors

J. Kleef

Liverpool, United Kingdom

P. Schemmer

Graz, Austria

Associate Staff Editors

S. Acuna

Toronto, Canada

G. Alsfasser, MD

Rostock, Germany

F. A. Angarita, MD, MSc, FRCSC

Buffalo, New York, United States of America

FEEDBACK 

J. Clark

London, United Kingdom

F. G. Del Ángel

Tampico, Mexico

T.J. Evans

London, United Kingdom

A. Frampton

London, United Kingdom

T. Golden, MD

Rockville, Maryland, United States of America

E. Ntouvali, MD, PhD, FEBOT, FEBHS

Athens, Greece

Junior Staff Editors

S. Agrawal

Jodhpur, Rajasthan, India

B. Al-Dulaimy

London, United Kingdom

Y. Al Omran

London, United Kingdom

FEEDBACK 

M.O. Anwar

London, United Kingdom

M.R. Borrelli

London, United Kingdom

K.A. Burke

Manchester, United Kingdom

A. Cristaudo

Caboolture, Queensland, Australia

T. Franchi

Sheffield, United Kingdom

B. Gundogan

Stevenage, United Kingdom

A. Gwozdz

London, United Kingdom

M.S. Hu

Stanford, California, United States of America

T. Joseph

London, United Kingdom

K. Koshy

London, United Kingdom

FEEDBACK 

S.Y. Lee

Southampton, United Kingdom

C. Limb

London, United Kingdom

D. Mani

Puyallup, Washington, United States of America

K. Shah

Oxford, United Kingdom



Copyright © 2022 Elsevier B.V. or its licensors or contributors.
ScienceDirect® is a registered trademark of Elsevier B.V.

RELX™

Nottingham, United Kingdom

Glasgow, United Kingdom

All members of the Editorial Board have identified their affiliated institutions or organizations, along with the corresponding country or geographic region. Elsevier remains neutral with regard to any jurisdictional claims.

FEEDBACK 



Annals of Medicine and Surgery

Open access

1.4

CiteScore

[Submit your article](#) ↗[Guide for authors](#) ↗

Menu

[Search in this journal](#)

Volume 81

In progress (September 2022)

This issue is in progress but contains articles that are final and fully citable.

[← Previous vol/issue](#)[Next vol/issue >](#)

Receive an update when the latest issues in this journal are published

[Sign in to set up alerts](#)

Original Research

Research article ● Open access

Impact of a same day admission project in reducing the preoperative bed occupancy demand in a pediatric inpatient hospital

Anqaa Almutairi, Hamad Alkhalaf, Angela Caswell, Litaba Efraim Kolobe, ... Jubran Alqanatish

Article 104304

[Download PDF](#) Article preview ▾

Research article ● Open access

Trans-pedal access for endovascular revascularization in complex infra-popliteal lesions in critically ischemic limb: A cohort study

Mohamed S. Abdelgawad, Adel Wahba, Amr M. Elshafie, Mahmoud Abdelnaby, Khalid A. Mowafy

Article 104215

[Download PDF](#) Article preview ▾

Research article ● Open access

Predictive factors of heart failure in acute coronary syndrome: Institutional cross-sectional study

FEEDBACK

Abakar Bachar, Fatima Azzahra Benmessaoud, Abdoulaye Diatta, Hassan Fadoum, ... Mohammed Cherti
Article 104332

[Download PDF](#) Article preview 

Research article ● *Open access*

Evaluation of mini-PCNL and RIRS for renal stones 1–2 cm in an economically challenged setting: A prospective cohort study

Sarwar Noori Mahmood, Choman J. Ahmed, Hewa Tawfeeq, Rawa Bapir, ... Noor Buchholz
Article 104235

[Download PDF](#) Article preview 

Research article ● *Open access*

The effect of COVID-19 on orthopedic elective/emergency procedures in a tertiary hospital Riyadh Saudi Arabia. A cross-sectional study

Abdullellah Abunayan, Bader Aljadaan, Mohammed Almudayfir, Sayaf Alshareef, Abdulaziz alamer
Article 104331

[Download PDF](#) Article preview 

Research article ● *Open access*

Post-operative pain and associated factors after cesarean section at Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia: A cross-sectional study

Ibrahim Hussen, Misganaw Worku, Dereje Geleta, Abbas Ahmed Mahamed, ... Muhiddin Tadesse
Article 104321

[Download PDF](#) Article preview 

Research article ● *Open access*

Emergency nurses perceived barriers to effective pain management at emergency department in Amhara region referral hospitals, Northwest Ethiopia, 2021. Multi-center cross sectional study

Belete Muluadam Admassie, Girmay Fitiwi Lema, Yonas Admasu Ferede, Biresaw Ayen Tegegne
Article 104338

[Download PDF](#) Article preview 

Research article ● *Open access*

The impact of the COVID-19 pandemic on the career choice of medicine: A cross-sectional study amongst pre-medical students in Pakistan

Raisa Saleh, Russell Seth Martins, Muhammad Saad, Asad Saulat Fatimi, ... Sarah Nadeem
Article 104219

[Download PDF](#) Article preview 

Research article ● *Open access*

Behaviour and epidemiology of differentiated thyroid cancer among filipinos in and outside the Philippines: Comparison between Qatar, Canada and Philippines

Mohamed Said Ghali, Walid El Ansari, Abdelrahman Abdelaal, Mohamed S. Al Hassan
Article 104202

FEEDBACK 

[Download PDF](#) Article preview 

Research article ● *Open access*

Prevalence of malnutrition and associated factors among children aged 6–24 months under poverty alleviation policy in Shanxi province, China: A cross-sectional study

Minli Zhang, Nelbon Giloi, Yang Shen, Yan Yu, ... Mei Ching Lim

Article 104317

[Download PDF](#) Article preview 

Research article ● *Open access*

Analysis of hepatic markers and lipid profile of patients submitted to gastric by-pass after 2 years – Cohort retrospective

Flaviana Freitas Pedron, Deise Silva de Moura, Aline Calcing, Luciana Dapieve Patias, ... Cristina Machado Bragança de Moraes

Article 104211

[Download PDF](#) Article preview 

Research article ● *Open access*

Effect of primary balloon angioplasty on draining vein diameter and volume flow in patients with arteriovenous fistula: A cohort study

R. Suhartono, Suhendro, Harrina Erlianti Rahardjo, Alida Roswita Harahap, ... Rafelis Rustam

Article 104426

[Download PDF](#) Article preview 

Research article ● *Open access*

Is cancer significant comorbid condition in COVID 19 infected patients? -A retrospective analysis experienced in a tertiary care center in Eastern India

Kalyan K. Mukherjee, Aniruddha Dam, Deepa Chakrabarti, Debasish Jatu, ... Jayanta Chakrabarti

Article 104248

[Download PDF](#) Article preview 

Research article ● *Open access*

The role of diphenhydramine HCl on tumor necrosis factor- α levels in wistar rats with traumatic brain injury: An in vivo study

Venansius Ratno Kurniawan, Andi Asadul Islam, Willy Adhimarta, Andi Alfian Zainuddin, ... Muhammad Faruk

Article 104399

[Download PDF](#) Article preview 

Research article ● *Open access*

Practice towards perioperative care of cesarean delivery in Debre Tabor Comprehensive Specialized Hospital, North Central Ethiopia: Cross-sectional study

Yewlsew Fentie Alle, Moges Gelaw Taye, Shimelis Seid Tegegne

Article 104409

[Download PDF](#) Article preview 

FEEDBACK 

Research article ● *Open access*

Investigation of the clinical features and recurrence patterns of acute right-sided colonic diverticulitis: A retrospective cohort study

Moon Young Oh, Rumi Shin, Seung Chul Heo, Han-Ki Lim, ... Kyu Joo Park

Article 104431

[Download PDF](#) Article preview 

Research article ● *Open access*

Surgical safety checklist compliance: The clinical audit

Fahad Gul, Maheen Nazir, Khawar Abbas, Alishba Ashraf Khan, ... Arbab Osama Naseem

Article 104397

[Download PDF](#) Article preview 

Research article ● *Open access*

Intra-abdominal cystic lymphangioma in adults: A case series of 32 patients and literature review

Houcine Maghrebi, Chaima Yakoubi, Hazem Beji, Feryel Letaief, ... Montasser Kacem

Article 104460

[Download PDF](#) Article preview 

Research article ● *Open access*

Obstetrics mortality and associated factors in intensive care unit of Addis Ababa public hospital in, 2020/21: A hospital based case control study

Asaminew Tasew, Eyayalem Melese, Suleman Jemal, Lemlem Getachew

Article 104458

[Download PDF](#) Article preview 

Research article ● *Open access*

The value of BCL2 and CK20 expression in predicting behavioral patterns of bladder cancer, a cross sectional study

Elham Pourebrahimi, Hedieh Moradi Tabriz, Seyed Amir Miratashi Yazdi, Elham Nazar, Sara Batmani

Article 104372

[Download PDF](#) Article preview 

Research article ● *Open access*

COVID-19 effects on operating room cancellations at a pediatric tertiary care hospital: A retrospective cohort study

Wen Jiang, Daniela Carvalho

Article 104427

[Download PDF](#) Article preview 

Research article ● *Open access*

Maternal satisfaction and practice of preoperative anaesthesia evaluation among pregnant who underwent elective caesarean section, cross-sectional study

Belete Muluadam Admassie, Yonas Admasu Ferede, Biresaw Ayen Tegegne

Article 104337

FEEDBACK 

[Download PDF](#) Article preview 

Research article ● *Open access*

A retrospective cohort report of single-incision laparoscopic cholecystectomies in Saudi Arabia: Postoperative outcomes and patient satisfaction

Khalil Terro, Mohanad Baroudi, Rawan Alsaoud, Belal Nedal Sabbah, ... Saud Al-Shanafey
Article 104245

[Download PDF](#) Article preview 

Research article ● *Open access*

The magnitude and associated factors of post-operative pain among adult patients

Cham Ojulu Othow, Yonas Admasu Ferede, Hailu Yimer Tawuye, Habtu Adane Aytolign
Article 104406

[Download PDF](#) Article preview 

Research article ● *Open access*

Magnitude and predictors of first-line antiretroviral therapy regimen change among HIV infected adults: A retrospective cross sectional study

Niguse Meles Alema, Solomon Weldegebreal Asgedom, Mahlet Maru, Beletu Berihun, ... Sintayehu Mulugeta Tamru
Article 104303

[Download PDF](#) Article preview 

Research article ● *Open access*

Irritable bowel syndrome in adults: Prevalence and risk factors

Muhammad Hamayl Zeeshan, Naga Praneeth Vakkalagadda, Gummadi Sai Sree, Krishna kishore Anne, ... Mohammad Hasan
Article 104408

[Download PDF](#) Article preview 

Research article ● *Open access*

The effect of plastic tape seal to reduce face seal leak in respirator N-95 type 1860

Mirta Hedyati Reksodiputro, Harim Priyono, Luthfi Ari Wibowo, Jenny Bashiruddin, ... Prasandhya Astagiri Yusuf
Article 104287

[Download PDF](#) Article preview 

Research article ● *Open access*

Determinant factors of under-five mortality in rural Ethiopia

Getahun Dejene Yemane
Article 104371

[Download PDF](#) Article preview 

Research article ● *Open access*

FEEDBACK 

Knowledge, attitudes and practices towards Evidence-Based-Dentistry regarding dental practitioner: A cross-sectional study

Ghita kadri, Zahra Enejari, Amal Bouziane
Article 104289

[Download PDF](#) Article preview 

Research article  *Open access*

Vaping and smokeless tobacco control in South Asia: A policy review

Nishwa Azeem, Zouina Sarfraz, Azza Sarfraz, Namrata Hange, ... Ivan Cherrez-Ojeda
Article 104285

[Download PDF](#) Article preview 

Research article  *Open access*

Does small bite closure reduce the incidence of incisional hernia compared to standard mass closure for midline laparotomy?

Kareemaldin Elsamani, Ahmed Abdel Rahim, Safaa Hamid
Article 104485

[Download PDF](#) Article preview 

Research article  *Open access*

Physical exam is not an accurate predictor of injury in geriatric patients with low-energy blunt trauma - A retrospective cohort study

T. Kania, S. Pandya, S. Demissie, D. Abdelhalim, ... A. Gave
Article 104503

[Download PDF](#) Article preview 

Research article  *Open access*

A retrospective cohort study of bladder cancer following the COVID-19 pandemic: Are patients presenting with more aggressive disease?

Steven Anderson, Kate Rigney, Leah Hayes, Paul Christopher Ryan, ... Subhasis K. Giri
Article 104430

[Download PDF](#) Article preview 

Research article  *Open access*

Case series about physiological astigmatism and the impact of pterygium surgery

Abdoul Salam Youssoufou Souley, Khidrou Fadhoulouhi Oumarou Sambou, Nouhou Diori Adam, Eriga Lucrece Joanelle, Amza Abdou
Article 104488

[Download PDF](#) Article preview 

Research article  *Open access*

The effects of hydroxyethyl starch 130/0.4 on perioperative renal function in patients undergoing cardiac surgery: A randomised controlled trial

Kei Nagaya, Akiko Yoshida, Yosuke Ito, Suguru Watanabe, ... Yoshifumi Saijo

FEEDBACK 

Article 104475

[Download PDF](#) Article preview 

Research article ● *Open access*

Intratympanic injection of dexamethasone for management of labyrinthitis associated with COVID-19 disease resistant cases

Wael F. Ismaiel, Mohamed H. Abdelazim, Ashraf A. Wahba, Mahmoud E. Alsobky, ... Elshahat I. Ismail
Article 104429

[Download PDF](#) Article preview 

Research article ● *Open access*

Antibacterial effects and cellular mechanisms of iron oxide magnetic nanoparticles coated by piroctone olamine against some cariogenic bacteria

Sajad Ghorbanizadeh, Fatemeh Karami, Somayeh Delfani, Mojtaba Shakibaie, ... Faranak Rezaei
Article 104291

[Download PDF](#) Article preview 

Research article ● *Open access*

Patient waiting time analysis for elective gynecologic surgeries in a tertiary training hospital in the Philippines: A retrospective cross-sectional study

Glaiza S. de Guzman, Maria Lilibeth L. Sia Su
Article 104403

[Download PDF](#) Article preview 

Research article ● *Open access*

Comparison complications rate between double-J ureteral stent and percutaneous nephrostomy in obstructive uropathy due to stone disease:A randomized controlled trial

Maher Al-Hajjaj, Aziz Joseph Sabbagh, Ibrahim Al-Hadid, Mohamed Taher Anan, ... Mohamed Tallaa
Article 104474

[Download PDF](#) Article preview 

Research article ● *Open access*

Prevalence of acute kidney injury amongst Covid-19 admitted patients in Ribat Teaching Hospital isolation centre: A retrospective cross-sectional study

Hussein Elsadig, Abdalla Ismail, Khalda Khalid, Faisal Elsayed, Khalid Ahmed
Article 104404

[Download PDF](#) Article preview 

Research article ● *Open access*

Study of variation glycated haemoglobin in diabetic patients using PCA method. Case study: Moroccan eastern region

Wissale Oujidi, Rachid Sekhsoukh, Youssef Harrar, Mohammed Amine Mehdi
Article 104459

[Download PDF](#) Article preview 

FEEDBACK 

Research article ● Open access

Outcomes of laparoscopic repair in complicated groin hernia: A single institutional based cohort study in Nepal

Bhawani Khanal, Sunit Agrawal, SashiShekhar Adhikari, Robal Lacoul, ... Rakesh Kumar Gupta

Article 104466

[Download PDF](#) Article preview 

Research article ● Open access

The relationship between oxytocin levels with empathy and breastfeeding intention in female medical students: A cross-sectional study

Tria Astika Endah Permatasari, Amir Syafruddin

Article 104486

[Download PDF](#) Article preview 

Review Articles

Review article ● Open access

Landscape, barriers, and facilitators of scientific productivity in schizophrenia research in Southeast Asia: A bibliometric analysis

Mary Nadine Alessandra R. Uy, Ourlad Alzeus G. Tantengco

Article 104330

[Download PDF](#) Article preview 

Review article ● Open access

Prognostic value of neutrophil-to-lymphocyte ratio (NLR) in penile cancer: A systematic review and meta-analysis

Haviv Muris Saputra, Furqan Hidayatullah, Yudhistira Pradnyan Kloping, Johan Renaldo, ... Lukman Hakim

Article 104335

[Download PDF](#) Article preview 

Review article ● Open access

Comparative efficacy and safety of holmium laser enucleation of the prostate (HoLEP) using moles technology and standard HoLEP: A systematic review, meta-analysis, and meta-regression

Muhammad Zaniar Ramadhani, Yudhistira Pradnyan Kloping, Ilham Akbar Rahman, Niwanda Yogiswara, ... Soetojo Wirjopranoto

Article 104280

[Download PDF](#) Article preview 

Review article ● Open access

In vivo and in vitro inhibition effect of propolis on *Klebsiella pneumoniae*: A review

Feni Fitriani Taufik, Rosdiana Natzir, Ilhamjaya Patellongi, Arif Santoso, ... Andini Febrianti

Article 104388

[Download PDF](#) Article preview 

Review article ● Open access

FEEDBACK 

Congenital talipes equinovarus: A literature review

M. Nasser Mustari, Muhammad Faruk, Arman Bausat, Achmad Fikry

Article 104394

[Download PDF](#) Article preview 

Review article  *Open access*

Is there a need to be worried about the new monkeypox virus outbreak? A brief review on the monkeypox outbreak

Nour Shaheen, Rehab Adel Diab, Mostafa Meshref, Ahmed Shaheen, ... Sheikh Shoib

Article 104396

[Download PDF](#) Article preview 

Review article  *Open access*

Hyperoxia in the management of respiratory failure: A literature review

Elvina Elizabeth Lius, Irmu Syafaah

Article 104393

[Download PDF](#) Article preview 

Review article  *Open access*

A review on acute, severe hepatitis of unknown origin in children: A call for concern

Olivier Uwishema, Ashraf Mahmoud, Jack Wellington, Suhaila Mamdouh Mohammed, ... Barakat Kolawole

Article 104457

[Download PDF](#) Article preview 

Review article  *Open access*

Elective surgeries during and after the COVID-19 pandemic: Case burden and physician shortage concerns

Aashna Mehta, Wireko Andrew Awuah, Jyi Cheng Ng, Mrinmoy Kundu, ... Mohammad Mehedi Hasan

Article 104395

[Download PDF](#) Article preview 

Review article  *Open access*

Acute hepatitis of unknown origin in Europe—Adding fuel to already burning pandemic

Maliha Tahir, Sejal Lund, Amatul Hadi Hamdana, Shahzaib Ahmad, ... Muhammad Muneeb Khawar

Article 104392

[Download PDF](#) Article preview 

Review article  *Open access*

Quality of life after extraction of mandibular wisdom teeth: A systematic review

Lamiaie Hallab, Asma Azzouzi, Bassima Chami

Article 104387

[Download PDF](#) Article preview 

Review article  *Open access*

FEEDBACK 

Children in detention amidst COVID-19 in Africa: A wound untreated

Shahzaib Ahmad, Abdullahi Tunde Aborode, Sanni Lateefat Oluwatomisin, Blessing Abai Sunday, ... God'salvation Fechukwu Oguibe
Article 104217

[Download PDF](#) Article preview 

Review article  *Open access*

Perioperative management of the thyrotoxic patients: A systematic review

Misganew Terefe, Yosef Belay Bizuneh, Yonas Addisu Nigatu, Debas Yaregal Melesse
Article 104487

[Download PDF](#) Article preview 

Case Reports

Case report  *Open access*

Renovascular hypertension secondary to Takayasu's arteritis in a child: Case report

Ricardo Filipe Souza Magalhães, Priscilla Ribeiro dos Santos Campelo, Juliana da Costa Matos, José Emerson dos Santos Souza, ... Leonardo Pessoa Cavalcante
Article 104247

[Download PDF](#) Article preview 

Case report  *Open access*

Periprosthetic knee infection after benign tumor excision complicated by carbapenem resistant Enterobacteriaceae: A case report

Jennifer P. Adams, Daniel Habenicht, Duncan Ramsey
Article 104292

[Download PDF](#) Article preview 

Case report  *Open access*

Significant response to Pembrolizumab for metastatic cutaneous squamous cell carcinoma in patient with Netherton syndrome

Salem M. Tos, Bilal Nabeel Alqam, Narmeen Giacaman, Mohammad G. Ibdah, ... Abdallah Altell
Article 104323

[Download PDF](#) Article preview 

Case report  *Open access*

How to prioritize treatment in dual malignancy: A case report of patient with non-Hodgkin lymphoma and breast cancer

Alvi Chomariyati, Muhammad Noor Diansyah, Putu Niken Ayu Amrita, Pradana Zaky Romadhon, ... Merlyna Savitri
Article 104300

[Download PDF](#) Article preview 

Case report  *Open access*

FEEDBACK 

Autoimmune gastritis in a male adolescent with cerebellar involvement: A case report

Prakash Sapkota, Sadikshya Bhandari, Bhuwan Thapa, K.C. Sajana, Pramita Shrestha

Article 104228

[Download PDF](#) Article preview 

Case report  *Open access*

Kidney transplantation from brain-dead donors in Nepal: Report of first six cases

Pukar Chandra Shrestha, Tika Ram Bhandari, Mohan Devbhandari, Rakesh Kumar Verma, Kalpana Kumari Shrestha

Article 104386

[Download PDF](#) Article preview 

Case report  *Open access*

Generalized tetanus in an elderly patient: A case report

Shiva Pratik Sah, Surendra Khanal, Sujata Dahal, Apurva Shrestha, Bulbul Pradhan

Article 104465

[Download PDF](#) Article preview 

Case report  *Open access*

An unusual presentation of recurrent COVID-19 associated systemic capillary leak syndrome in a patient with multi-system inflammatory syndrome in adults (MIS-A) due to prior COVID-19 infection: Case report and literature review

Shifa Younus, Hamza Maqsood

Article 104309

[Download PDF](#) Article preview 

Case report  *Open access*

Double neuraxial catheter (Subarachnoid and epidural) in obese patient cancer surgery: A case report

Lou'i Al-Husinat, Fannia Barletta, Vittoria Gammaldi, Alameen Alsabbah, Domenico Gammaldi

Article 104446

[Download PDF](#) Article preview 

Case report  *Open access*

Severe hemolysis with negative direct antiglobulin test: A case report

Mahin Behzadifard, Ali Arianezhad, Ali Bandehzadeh, Mohammadali Gholampour

Article 104444

[Download PDF](#) Article preview 

Case report  *Open access*

Adult omental alveolar rhabdomyosarcoma: An unusual site. A case report and literature review

Anwar Chammout, Mohamad Sami Alshutaihi, Ahmad Beshr Kelarji, Mouiad Naser, ... Rama Alyousfi

Article 104464

[Download PDF](#) Article preview 

FEEDBACK 

Case report ● *Open access*

Peritoneal melanosis associated with serous carcinoma of the ovary: A case report and literature review

Mohammed Mhand, Rockson Obed, Abdelhakim Harouachi, Anas Haloui, ... Tijani EL. Harroudi

Article 104452

[Download PDF](#) Article preview 

Case report ● *Open access*

A rare case of Allgrove Syndrome associated with growth hormone deficiency in an 8-year-Old child: A case report

Mahfoud Eid, Ahmad Chreitah, Omar Aljanati, Aria Mohammed, ... Zeina Alkilany

Article 104352

[Download PDF](#) Article preview 

Case report ● *Open access*

An acute lower limb ischemia revealing a covid-19 infection: A case report

Rim EL Mesnaoui, Soumaila Nikiema, Desire Massimbo, Abbas EL Mesnaoui

Article 104445

[Download PDF](#) Article preview 

Case report ● *Open access*

Prenatal diagnosis of rare cloacal exstrophy: A case report

Febriani, Muhammad Alamsyah Aziz

Article 104436

[Download PDF](#) Article preview 

Case report ● *Open access*

ABO incompatible living donor liver transplant with antibody titer of 1:4: First case report from Pakistan

Abdul Wahab Dogar, Kaleem Ullah, Hafiz Bilal, Muhammad Shahzad Sarwar, ... Syed Hasnain Abbas

Article 104463

[Download PDF](#) Article preview 

Case report ● *Open access*

Thyrotoxic periodic paralysis in a patient with Graves' disease: A case report

Sanjeev Kharel, Rajeev Ojha, Naresh Parajuli, Shiva Bhattarai, ... Ashish Shrestha

Article 104447

[Download PDF](#) Article preview 

Case report ● *Open access*

Non-Hodgkin's lymphoma masquerading as splenic abscess: A case report

Qaisar Ali Khan, Arif Mumtaz, Abdul Baqi, Hoor Ul Ain, ... Zohaib Yousaf

Article 104449

[Download PDF](#) Article preview 

FEEDBACK 

Case report ● *Open access*

Poor in vitro fertilisation outcomes in genital tuberculosis – Case report

Dian Tjahyadi, Kevin Dominique Tjandraprawira

Article 104438

[Download PDF](#) Article preview 

Case report ● *Open access*

Helical plating for a re-nonunion and a peri-implant fracture after humeral intramedullary nailing: A report of two cases

Shuya Nohmi, Masahiro Suzuki, Yukiko Sakamoto

Article 104442

[Download PDF](#) Article preview 

Case report ● *Open access*

Isolated abducens nerve palsy following AstraZeneca vaccine: A case report

Krity Basnet, Rupa Bhandari, Kushal Basnet, Ananta Aryal, Reshma Shrestha

Article 104434

[Download PDF](#) Article preview 

Case report ● *Open access*

Carcinosarcoma of the colon with extensive and extraordinary metastases detected on F-FDG18PET/CT: A case report

Meryem Maskrout, Farah Boutagount, Rania Mokfi, Ghizlane Ennibi, ... Ghizlane Rais

Article 104450

[Download PDF](#) Article preview 

Case report ● *Open access*

A child diagnosed with midaortic syndrome and inherited thrombophilia after presenting with a stroke: A case report

Narmeen Giacaman, Salem M. Tos, Mohammad G. Ibdah, Mohamad K.M. Ismail, Nael Hussein Ellahham

Article 104455

[Download PDF](#) Article preview 

Case report ● *Open access*

Splenic vein thrombosis in cirrhosis of the liver: A rare case

Arina Mana Sikana, Husin Thamrin

Article 104439

[Download PDF](#) Article preview 

Case report ● *Open access*

Obstruction of ventriculoperitoneal shunt by air bubble: A case report

Marouane Makhchoune, Michel Triffaux, Triantafyllos Bouras, Xavier Hamoir

Article 104351

[Download PDF](#) Article preview 

FEEDBACK 

Case report ● *Open access*

Behcet's disease: Diagnosed as isolated recurrent oral aphthae; a case report

Maysoun Kudsi, Naram Khalayli, Amr Allahham

Article 104327

[Download PDF](#) Article preview 

Case report ● *Open access*

Recurrent retroperitoneal extra-renal angiomyolipoma: A case report and review of literature

Narjes Mohammadzadeh, Soroush Kohansal, Amir ghasemlouei

Article 104230

[Download PDF](#) Article preview 

Case report ● *Open access*

Le Fort III fractures: An approach to resuscitation and management

R. Pswarayi, C. Burns

Article 104513

[Download PDF](#) Article preview 

Case report ● *Open access*

Vulvar melanoma: A diagnostic challenge for young women - a case report

Mouhsine Omari, Adil Zaimi, Hanane Hadj Kacem, Said Afqir

Article 104473

[Download PDF](#) Article preview 

Case report ● *Open access*

Malaria causing post-infectious cerebellitis, a case report and literature review

Mohamad Hijazi, ELMustafa Abdalla, Abdalla Fadul, Doaa Ahmed Eltayeb, Abdulrahman Al-Mashdali

Article 104462

[Download PDF](#) Article preview 

Case report ● *Open access*

Mesenteric inflammatory myofibroblastic tumor mimicking acute appendicitis: A case report

Saroj Kumar Yadav, Himad Bikram Bhattarai, Saurav Subedi, Anish Shrestha, ... Bidhan Bikram Shah

Article 104456

[Download PDF](#) Article preview 

Case report ● *Open access*

A rare combination of acute myeloid leukemia with Vit B12 deficiency: Case report

Mohammad Nour Kitaz, Rama Zazo, Muhammad Alsabbagh, Muhammad Diabi, ... Anwar Chammout

Article 104500

[Download PDF](#) Article preview 

FEEDBACK 

Short Communications

Short communication ● *Open access*

Monkeypox and spillover effects: Stigmas, solutions and strategies

Hamna Raheel, Maham Raheel, Muhammad Ahmed Ali Fahim, Unaiza Naeem
Article 104346

[Download PDF](#)

Short communication ● *Open access*

Radiofrequency ablation for management of thyroid nodules in quarantine zone of COVID-19 pandemic setting in Indonesia

Kristanto Yuli Yarso, Sumadi Lukman Anwar
Article 104132

[Download PDF](#) Article preview 

Short communication ● *Open access*

Rise of cholera in Iraq: A rising concern

Khulud Qamar, Umer Usman Malik, Juvairia Yousuf, Mohammad Yasir Essar, ... Jaffer Shah
Article 104355

[Download PDF](#) Article preview 

Short communication ● *Open access*

Monkeypox: Potentially another pandemic or a mere hoax?

Sajeel Saeed, Haroon Shabbir, Jawad Basit, Mohammad Ebad ur Rehman
Article 104364

[Download PDF](#) Article preview 

Short communication ● *Open access*

CABG versus PCI: What is the optimal strategy for multi-vessel disease?

Ayush Kumar, Priya, Govinda Khatri, Mohammad Mehedi Hasan
Article 104354

[Download PDF](#)

Short communication ● *Open access*

Nairobi fly in South Asia: A catastrophic threat of the nature

Amrit Pokhrel, Sanjiv Bastakoti
Article 104358

[Download PDF](#)

Short communication ● *Open access*

Seasonal hyperacute panuveitis: Call for greater attention to Nepal

Saral Lamichhane, Amrit Pokhrel, Prakriti Lamichhane

FEEDBACK 

Article 104363

[Download PDF](#)

Short communication ● *Open access*

Medication non-compliance: A challenge in treating hypertension in Nepal

Saral Lamichhane, Amrit Pokhrel, Nava Raj Sharma

Article 104362

[Download PDF](#)

Short communication ● *Open access*

Change in trend of poliovirus strain affecting Pakistan

Muhammad Hashir Nazir, Muhammad Ahmad, Muhammad Umer, Saleha Azeem

Article 104390

[Download PDF](#)

Short communication ● *Open access*

Dementia and non-alcoholic fatty liver disease – An unprecedented relationship

Fakhar Latif, Vania Saqib, Eisha Waqar

Article 104359

[Download PDF](#)

Short communication ● *Open access*

Increased burden of booster shots for COVID-19 amidst vaccine hesitancy in Pakistan

Priyanka Mohan Lal, Omer Ahmed Shaikh, Laiba Imran Vohra, Aabiya Arif, ... Kaleem Ullah

Article 104360

[Download PDF](#) Article preview 

Short communication ● *Open access*

Clinical audit on indications and technique of male urethral catheterization in emergency department of a tertiary care hospital

Shahan Waheed, Nazir N. Kapadia, Asefa S. Ansari, Sarwat Masud

Article 104389

[Download PDF](#) Article preview 





ScienceDirect® is a registered trademark of Elsevier B.V.

FEEDBACK 



Systematic Review / Meta-analysis

Comparative efficacy and safety of holmium laser enucleation of the prostate (HoLEP) using moses technology and standard HoLEP: A systematic review, meta-analysis, and meta-regression

Muhammad Zaniar Ramadhani^{a,b}, Yudhistira Pradnyan Kloping^{a,b}, Ilham Akbar Rahman^{a,b}, Niwanda Yogiswara^{a,b}, Johan Renaldo^{a,b,*}, Soetojo Wirjopranto^{a,b}

^a Department of Urology, Faculty of Medicine, Universitas Airlangga, Indonesia

^b Dr. Soetomo General-Academic Hospital, Mayjen Prof. Dr. Moestopo No.6-8, Surabaya, 60286, Indonesia

ARTICLE INFO

Keywords:

Prostatic hyperplasia

Moses HoLEP

Holmium laser enucleation of the prostate

HoLEP

ABSTRACT

Purpose: The use of HoLEP was associated with steep learning curve thus prolonging operative procedure. The problem of learning curve could be solved with the invention of Moses HoLEP. This study aimed to evaluate the comparison of efficacy and safety between Moses HoLEP and standard HoLEP in BPH patient.

Materials and methods: Systematic search was carried out using PRISMA guideline. Pubmed, Scopus and Embase were searched to collect randomized controlled trials and observational studies. Quantitative analysis was performed to evaluate the comparison in intraoperative, postoperative and complications characteristics. Rev-Man 5.4 and STATA were used in data analysis.

Results: Total of 7 studies (1226 patients) were included. Regarding intraoperative characteristics, Moses HoLEP provided significantly shorter enucleation time (MD: 3.00, 95% CI: 5.57 to -0.43, $p = 0.02$), shorter hemostasis time (MD: 3.79, 95% CI: 5.23 to -2.34, $p < 0.00001$), and shorter laser use time (MD: 2.79, 95% CI: 5.03 to -0.55, $p = 0.01$). For postoperative characteristics, Moses HoLEP possessed significantly lower PVR (MD -34.57, 95% CI -56.85 to -12.30, $p = 0.002$). Overall complication was higher in standard HoLEP although the result was not significant (MD 0.68, 95%CI: 0.38 to 1.21, $p = 0.19$). Moses HoLEP possessed more superiority over standard HoLEP regarding shorter hemostasis time with the increasing of prostate size (coefficient -0.894, $p = 0.044$).

Conclusion: Moses HoLEP demonstrated shorter enucleation time, shorter hemostasis time and shorter laser use time. Moses HoLEP also possessed lower PVR. There were no safety issues in Moses HoLEP compared with standard HoLEP.

1. Introduction

Benign prostate hyperplasia (BPH) is a disease caused by the proliferation of the benign prostate gland, which mostly affects older men, as many as 50% of men aged 60 years. Approximately 1 in 5 men with BPH accounts for significant clinical symptoms within 1 year since the first initiation of treatment. This disease also represents as the seventh highest 1-year disease-specific medical cost. Considering this together, the burden from health care of BPH is not trivial [1]. The incremental medical costs from this condition were observed in the recent years [2]. The etiology of BPH is still not fully known, however it is suggested to be

influenced by age, family history, hormonal conditions, increased inflammation, and metabolic syndrome. An enlarged prostate causes urinary problems or commonly known as Lower Urinary Tract Symptoms (LUTS), including decreased urine output, nocturia, and urgency, which possesses the potential to reduce the patient's quality of life. Treatment options for BPH ranged from watchful waiting, medical therapy such as alpha blocker, minimally invasive procedures, and open surgery [3,4].

Transurethral Resection of the Prostate (TURP) is gold standard operative treatment in mild to moderate enlargement of the prostate (30–80 ml). However, in large prostates, TURP has a higher rate of

* Corresponding author. Institution : Department of Urology, Faculty of Medicine, Universitas Airlangga, Dr. Soetomo General-Academic Hospital Surabaya, East Java, Indonesia.

E-mail address: joeurologi@gmail.com (J. Renaldo).

<https://doi.org/10.1016/j.amsu.2022.104280>

Received 31 May 2022; Received in revised form 21 July 2022; Accepted 26 July 2022

Available online 12 August 2022

2049-0801/© 2022 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

morbidity, complications, and repeated procedures. This is due to the presence of transurethral resection (TUR) syndrome if the duration of the TURP procedure prolonged. Moreover, many complications caused by TURP procedure include sexual dysfunction, retrograde ejaculation, recurrent urinary retention, and urethral stricture [4,5].

Since its introduction in 1998, holmium laser enucleation of the prostate (HoLEP) has become one of the minimally invasive therapeutic modalities which can be utilized for the treatment of BPH. The enucleation technique allows HoLEP to be used on all prostate sizes with good safety, efficacy, and durability. Therefore, in the current guidelines, HoLEP is the recommended standard therapy for the management of BPH in large prostates. However, currently the use of HoLEP is still considered suboptimal. This is due to steep learning curve prolonging the procedure, causing higher intraoperative bleeding, and increased complications [5,6].

Along with technological advancements, especially in the development of holmium laser technology, the steep learning curve which is the main obstacle in the use of HoLEP may be overcome. One of the laser technology developments that could be utilized is the Moses laser technology. Moses developed by Lumenis is able to divide the laser wave into 2 waves. The first energy wave separates the water by forming a bubble cavity, and the second wave was to transfer the laser energy through the bubble cavity directly to the target. These mechanisms were believed to increase the efficiency of the HoLEP procedure [6,7].

The evidence of Moses HoLEP in the treatment of BPH is still few. For

this reason, a systematic review, meta-analysis and meta-regression were conducted to compare the use of Moses technology in the HoLEP (m-HoLEP) procedure with standard HoLEP with respect to intraoperative, postoperative and complication outcome.

2. Material and methods

2.1. Search strategy

Up to January 2022, several databases comprised of Pubmed, Embase and Scopus were searched for clinical study (randomized controlled trial or observational study) evaluating the efficacy and safety of Moses HoLEP and standard HoLEP. The following keywords were used by combining several terms including “Moses HoLEP” OR “Moses holmium laser enucleation of the prostate” AND “holmium laser enucleation of the prostate” OR “standard HoLEP” OR “standard holmium laser enucleation of the prostate” AND “Benign prostatic hyperplasia”. Additional database was also involved to search for additional studies. There were no limitation of language, country, or publication year in this study. The search strategy was shown in Fig. 1. The protocol of this meta-analysis was registered in PROSPERO (CRD42021266151) and research registry ([reviewregistry1403](https://www.crd.york.ac.uk/PROSPERO/record/CRD42021266151)). This study also followed the guideline of PRISMA 2020 [8].

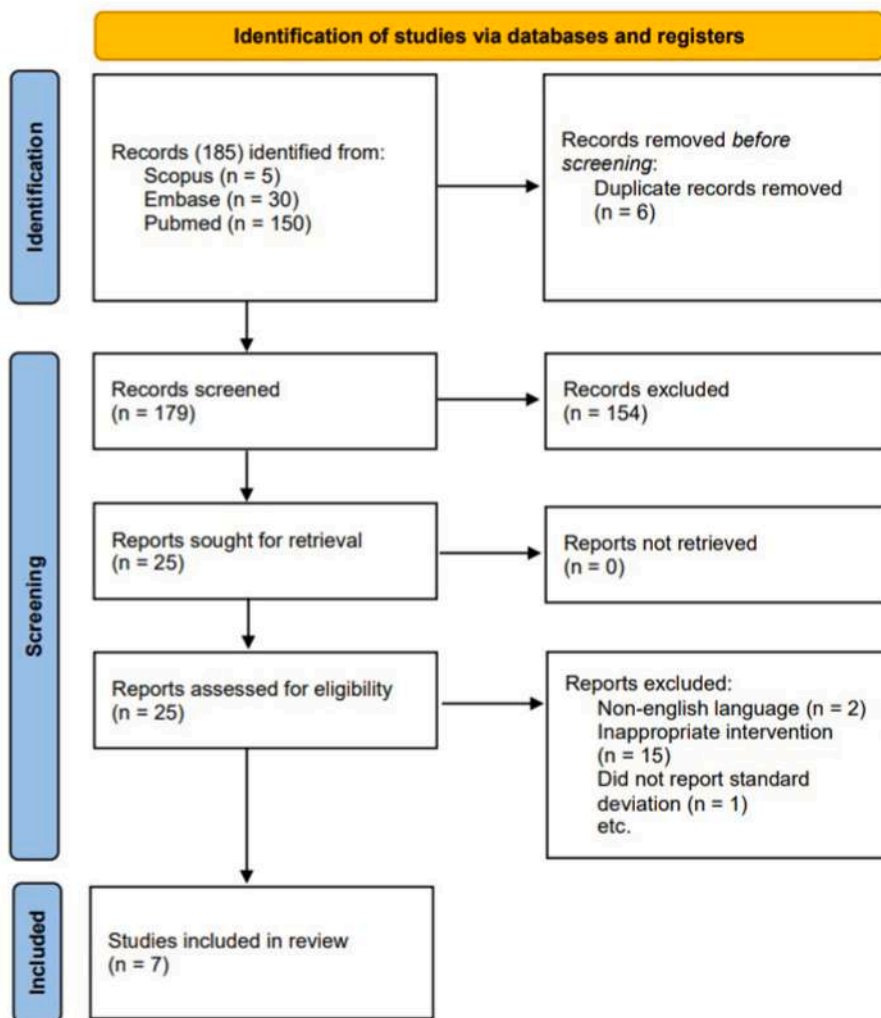


Fig. 1. PRISMA flow diagram in the systematic search.

2.2. Inclusion and exclusion criteria

Studies of randomized or non-randomized controlled trials which is in accordance with the following criteria were included in this systematic review and meta-analysis: The studies were included in this meta-analysis if they met following criteria: (1) the study evaluated a comparison between Moses HoLEP and standard HoLEP, (2) the study provided intended outcome consisting of intraoperative, postoperative and complications, (3) full-text study, and (4) English language article. The studies in the form of abstract, review article, and case report were excluded.

2.3. Quality assessment

Two authors independently evaluated all identified inclusion studies, and any disagreement between authors was resolved through the involvement of a third reviewer. Cochrane Risk of Bias (RoB) Tools 2 was used to assess RCT study. Newcastle Ottawa Scale (NOS) was used in the assessment of retrospective/observational study. The quality of this systematic review was also evaluated and assessed using AMSTAR 2 criteria [9].

2.4. Data extraction

Several baseline data were extracted from the inclusion studies including author, study design, sample size, publication year, population, Prostate-specific antigen (PSA) value, prostate weight, prostate volume, Body Mass Index (BMI), age, and intervention. The primary outcome in this study was the intraoperative characteristic consisted of total operative time, enucleation time, hemostasis time, laser use time. The secondary outcome was postoperative characteristic and complications rate. Postoperative characteristics comprised of post-void residual volume (PVR), peak urinary flow rate (Qmax) and The International Prostate Symptom Score (IPSS).

2.5. Statistical analysis

Heterogeneity between studies was assessed using I^2 test and p value. Heterogeneity was considered high if P value ≤ 0.05 and an I^2 value $\geq 50\%$ and random-effects model was performed. Heterogeneity was considered low if P value ≥ 0.05 and $I^2 \leq 50$ and fixed-effects model was performed. Continuous data were extracted in the form of mean and standard deviation and were pooled into mean difference. Dichotomous data were extracted and were pooled into Odds Ratio. Meta-regression was performed to assess the relationship between intraoperative time and prostate size. Egger regression test and Begg rank correlation test were undertaken to assess the risk of publication bias. For random effects model, sensitivity analysis was conducted to assess the consistency of outcome when low-quality and highly heterogeneous trials were included in the analysis. The analysis of this study was performed using RevMan 5.4 (Cochrane Collaboration, UK) and STATA ®16 (StataCorp LLC, US).

3. Results

3.1. Search results and study characteristics

PRISMA 2020 flowchart guide was implemented as a guide in the systematic search from several databases including Embase, Scopus, and Pubmed. A total of 185 articles were generated from the pre-defined keywords. After duplicates articles were removed and screening through titles and abstracts was performed based on the pre-defined PICO, a total of 178 articles were excluded. Full-text screening was carried out to evaluate the inclusion and exclusion criteria. Finally, 7 studies comprising of 2 RCTs and 5 observational retrospective studies were included in the present study. All included study evaluated the

comparison of the use of Moses HoLEP (m-HoLEP) and standard HoLEP in the treatment of BPH. All included studies in this meta-analysis were published between 2020 and 2021. All patients comprised with large BPH with the size of more than 80 cc. The total patients in this study were 914 patients. The detailed study characteristics were shown in [Table 1](#).

3.2. Risk of bias analysis

Cochrane ROB Tools for Randomized Trials instrument was used to evaluate the risk of bias from the RCT and the NOS to evaluate retrospective comparative studies. The Cochrane ROB Tools 2 was used to evaluate 2 RCT studies [10,11]. Kavoussi et al. was assessed as low risk of bias based on the five domains. However, the evaluation of Nevo et al. resulted as some concerns due to the D1 domain did not explain the process of allocation concealment from the study. Newcastle Ottawa Scale instrument evaluated 5 retrospective studies [12–16]. The evaluation of NOS instrument was classified into 3 groups which are low quality (0–3), medium quality (4–6) and high quality (7–9) [17]. In this study, the risk assessment of bias resulted in a score of at least 6 which indicated that the included studies had a quality assessment of the risk of bias with a minimum of moderate. The detailed assessment of risk of bias was shown in Supplementary materials.

3.3. Intraoperative results

There were 4 outcomes in the assessment of intraoperative results. These were total operative time, enucleation time, hemostasis time and laser use time. The result of the forest plot revealed that in comparison between Moses HoLEP and standard HoLEP, there was no significant difference in total operative time (MD: 7.15, 95% CI: 23.54 to 9.23, p 0.39). However, Moses HoLEP was significantly associated with shorter enucleation time (MD: 3.00, 95% CI: 5.57 to -0.43, p = 0.02), shorter hemostasis time (MD: 3.79, 95% CI: 5.23 to -2.34, p < 0.00001), and shorter laser use time (MD: 2.79, 95% CI: 5.03 to -0.55, p = 0.01). [Fig. 2](#) showed the detailed forest plot of intraoperative characteristics.

3.4. Post-operative results

Change in IPSS. [Fig. 3a](#) demonstrated that no significant difference was revealed between the 2 groups regarding change in IPSS between Moses HoLEP and standard HoLEP (MD: 0.05, 95% CI: 1.84 to 1.73, p = 0.95).

Qmax. There was no significant difference evaluated between Moses HoLEP and standard HoLEP in Qmax after the operative procedure (MD: 0.95, 95% CI: 1.66 to 3.57, p = 0.47) as shown in [Fig. 3b](#).

PVR. The statistically significant difference suggested a benefit of Moses HoLEP over standard HoLEP in post-void residual volume in which Moses HoLEP possessed significantly less PVR compared to standard HoLEP (MD -34.57, 95% CI -56.85 to -12.30, p = 0.002) as shown in [Fig. 3c](#).

3.5. Complications

The results revealed that no significant differences were found between Moses HoLEP and standard HoLEP with regards to overall complication (MD 0.68, 95%CI: 0.38 to 1.21, p = 0.19). Moreover, if the complications were subgrouped into Clavien-Dindo classification, the result also did not find any significant differences in less than 3 (MD 0.83, 95% CI: 0.33 to 2.1, p = 0.7) and more than 3 (MD 0.5, 95% CI: 0.17 to 1.44, p = 0.2). However, there was likely a trend that Moses HoLEP possessed less complications compared to standard HoLEP. Hemoglobin change between Moses HoLEP and standard HoLEP also did not significantly differ between the two groups (MD: 0.25, 95% CI: 0.57 to 0.06, p = 0.12). [Table 2](#) and [Fig. 4](#) showed the detailed complications rate analysis.

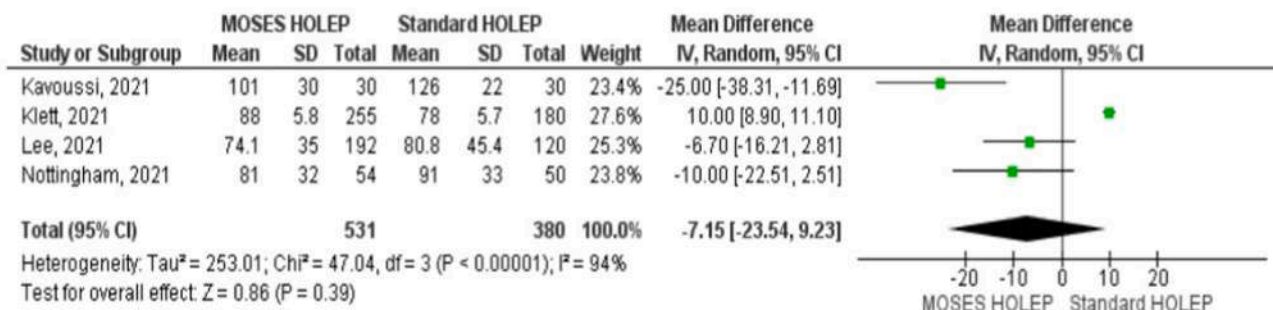
Table 1
Baseline characteristics of included studies.

Study	Study design	Population	PSA value		Prostate weight (gram)		Prostate size (ml)		BMI	Age (years)	Total sample	Intervention
			m-HoLEP	s-HoLEP	m-HoLEP	s-HoLEP	m-HoLEP	s-HoLEP				
Kavoussi NL (2021)	Double blind RCT	BPH patient undergoing Moses and Standard HoLEP	6.1 ± 2.6	5.6 ± 2.5	131 ± 41	153 ± 58	>80		29.25	69.35	60 patients (Moses 30, Standard HoLEP 30)	Lumenis 120 H dual pedal laser unit Moses HOLEP, 550 µm fibers, energy 2J and frequency 20–40 Hz
Nevo A (2020)	Double blind RCT	BPH patient undergoing Moses and Standard HoLEP	NR		58		107		NR	68 (55–78)	27 patients (Right lobe 27, Left lobe 27)	Lumenis pulse 120H, Moses 2.0 HOLEP 550 µm end fibre laser
Large T (2020)	Retrospective	BPH patient undergoing Moses and Standard HoLEP	8.39 ± 5.9	5.86 ± 4.8	76.7 ± 77.1	72.5 ± 49.6	155.6 ± 50.3	110.5 ± 85.5	27.85	71.1	100 patients (Moses 50, Standard HoLEP 50)	Lumenis Pulse 120H, Moses HOLEP 550 µm fibers, energy 2 J dan frequency 40 Hz
Nottingham CU (2021)	Retrospective	BPH patient undergoing Moses and Standard HoLEP	NR		77	73	NR		27.9	71.5	104 patients (Moses 54, Standard HoLEP 50)	Lumenis Pulse 120H, Moses 2.0 Holep 550 µm fibers, energy 2 J dan 40 Hz
Klett DE (2021)	Retrospective	BPH patient undergoing Moses and Standard HoLEP	NR		67	61	98 (69–124)	89 (65–120)	28	71.4	435 patients (Moses 255, Standard HoLEP 180)	Lumenis Pulse 120H, Moses 550 µm fibers, energy 2J and frequency 40 Hz
Mark A. Assmus (2021)	Retrospective	BPH patient undergoing Moses and Standard HoLEP	NR		NR		124.5 (51.8–161.3)	107.5 (79.8–129.6)	28.3	72.3	188 patients (Moses 93, Standard HoLEP 95)	Lumenis 120H, Moses 2.0, energy 2J and frequency 40 Hz
Matthew S. Lee (2021)	Retrospective	BPH patient undergoing Moses and Standard HoLEP	NR		114.8 ± 73.2	115.8 ± 90.4	NR		28.67	70.5	312 patients (Moses 192, Standard HoLEP 120)	Lumenis 120H, Moses 2.0, 550 µm laser fiber, energy 2J and frequency 40 Hz

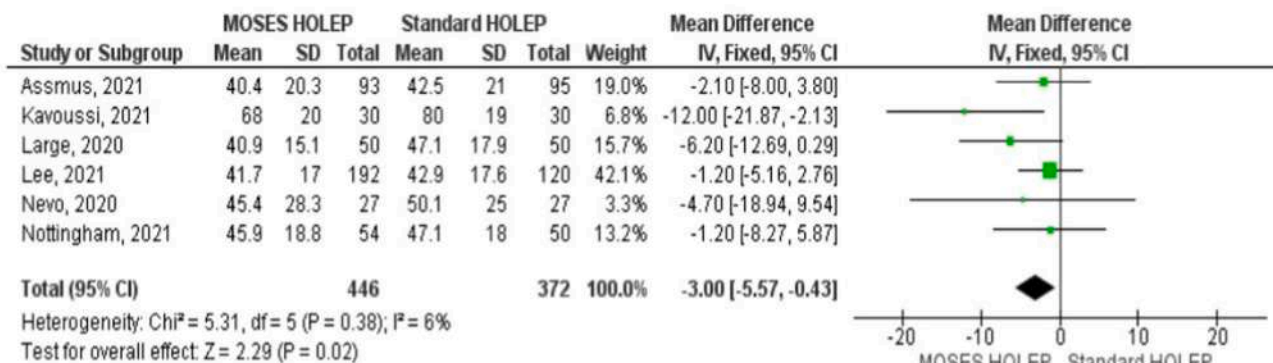
NR: not reported.

Intraoperative outcome

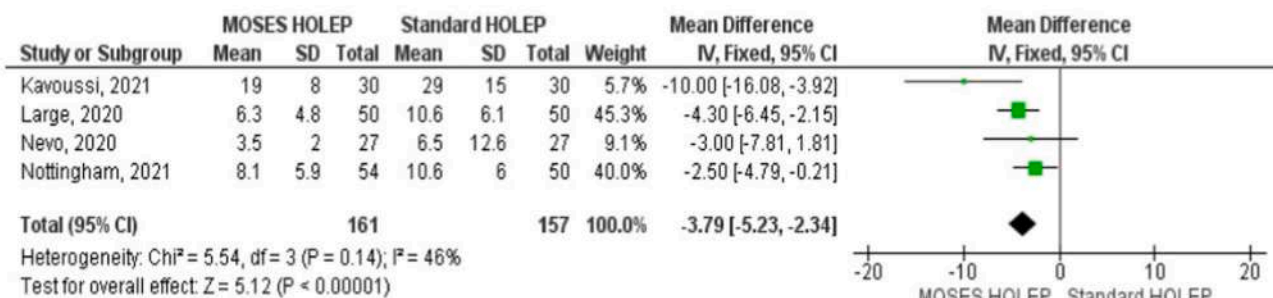
Total operative time



Enucleation time



Hemostasis time



Laser use time

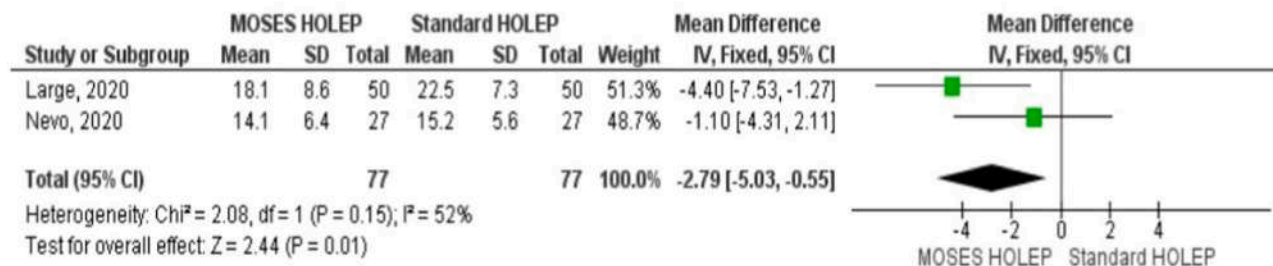
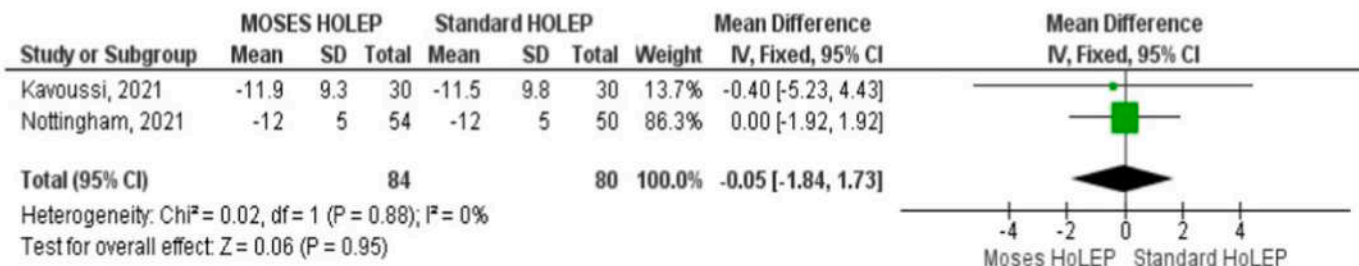


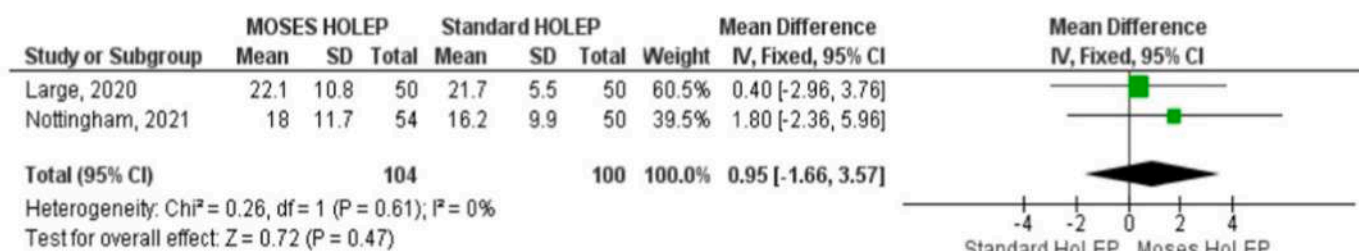
Fig. 2. Forest plot of intraoperative outcome consisted of total operative time, enucleation time, hemostasis time, laser use time.

Postoperative Outcome

IPSS score



Qmax (peak urinary flow rate)



PVR (Post-void residual volume)

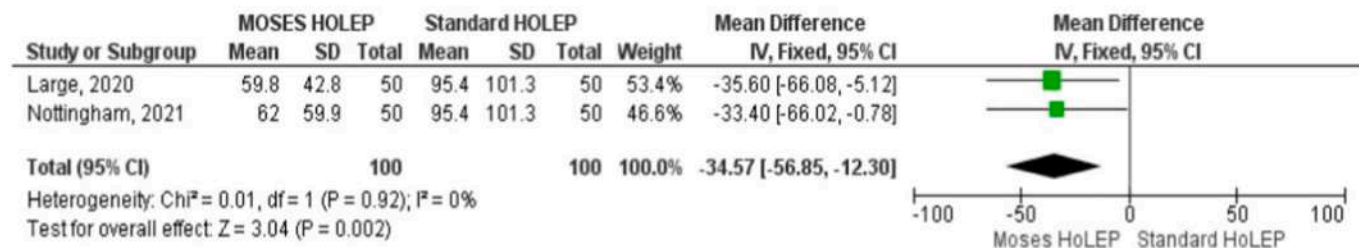


Fig. 3. Forest plot of postoperative outcome consisted of IPSS score, Qmax (peak urinary flow rate), Post-Void Residual Volume (PVR).

3.6. Meta-regression

The relationship between intraoperative procedure and prostate size was evaluated in meta-regression analysis. Our result revealed a significant association which Moses HoLEP possessed a more superiority over standard HoLEP regarding shorter hemostasis time with the increasing of prostate size (coefficient = -0.894, p = 0.044). The detailed analysis of meta-regression was shown in Table 3 and Fig. 5.

3.7. Publication bias assessment

Publication bias was assessed using funnel plot, Egger regression test and Begg rank correlation test. The results of funnel plots were symmetrical in almost all intraoperative outcome except for total operative time (Supplementary materials). Egger regression test showed the result of 0.173 and Begg rank correlation test revealed the result of 0.188 in almost all studies. All these analyses revealed that there were no significant publication biases detected in this meta-analysis. However, in

total operative time outcome, the asymmetry of funnel plot and inconsistency of sensitivity analysis suggested that this outcome may have significant publication bias.

4. Discussion

To the best of our knowledge, this is the first systematic review, meta-analysis and meta regression study to evaluate the comparison between Moses HoLEP laser technology and standard HoLEP in BPH patients. The HoLEP procedure is an effective treatment option for BPH specifically in large prostates [18,19]. Although holmium laser technology has existed for 25 years, the use of HoLEP technology was considered suboptimal in BPH patients. One of the reasons why this technology is still rarely used is because steep learning curve. The slow and longer learning process are complicated by the presence of bleeding, tissue damage, and scarring. Optimization of laser technology to overcome this problem may improve outcome and shorten the required time to master this technology [20].

Table 2
Complications rate between Moses HoLEP and standard HoLEP.

Study	Complications rate	
	Moses HoLEP	Standard HoLEP
Kavoussi NL (2021)	Cystitis (6.6%), urinary retention (3.3%)	Cystitis (6.6%), urinary retention (3.3%), syncope (%)
Nevo A (2020)	Deep vein thrombosis (1.7%), urinary tract infection (1.7%), epididymitis (1.7%), hematuria (1.7%)	
Large T (2020)	Clot urinary retention (1%), hematuria (2%), urinary tract infection (1%)	
Nottingham CU (2021)	Urinary retention (1.8%), urinary tract infection (14.8%), urethral stricture (1.8%), bladder neck contracture (3.7%)	Urinary tract infection (16%), clot urinary retention (2%), urethral strictures (2%)
Klett DE (2021)	NR	
Mark A. Assmus (2021)	Clavien-Dindo complications \geq 3b = 3 (6%)	Clavien-Dindo complications \geq 3b = 6 (12%)
Matthew S. Lee (2021)	Urinary retention (15%), hematuria (30%), UTI (5%), gastrointestinal (15%), respiratory (5%), musculoskeletal (5%), neurological (10%)	

The Moses HoLEP laser system forms the laser wave into 2 phases, the first phase was to separate the water by forming a bubble cavity and the second phase was to transfer the laser energy directly to the target [21]. This mechanism increased the amount of transferred laser energy to the target. This mechanism was also known as Moses effect. This mechanism was also explained from previous studies that the modulation of laser energy for enucleation process involves the formation of bubble cavity followed by the transfer of laser energy through the cavity and subsequently hit the targeted tissue [22,23]. The increased energy transfer by this technology increases the effectiveness of tissue ablation and hemostasis during the enucleation process, increases visibility, and makes it easier for surgeons to perform operations efficiently [6]. The results of this study suggested that Moses HoLEP significantly shorten the enucleation time, hemostasis time, and laser use time in intraoperative procedure. Moses HoLEP also showed superiority over standard HoLEP which Moses HoLEP possessed shorter hemostasis time with the increasing of prostate size. Moreover, in postoperative parameter, Moses HoLEP also possessed significantly less PVR compared to standard HoLEP.

In intraoperative outcome, our result suggested a superiority of Moses HoLEP in intraoperative outcome which Moses HoLEP possess the ability to shorten enucleation time, hemostasis time, and laser use time. The increased energy transfer via the 2-wave mechanism in this technology leads to an increase in the effectiveness of tissue ablation and hemostasis during the enucleation process, thereby increasing visibility and making it easier for surgeons to perform operations more efficiently. The shorter time in intraoperative procedure also represents the benefit of lowering the total cost required during this procedure [24]. The shorter time in Moses HoLEP is also associated with a lower incidence of capsular edema and a high degree of hemostasis, which may decrease the incidence of TWOC (Trial Without Catheter) failure which could lead to catheter reinsertion [15]. The increased energy transfer was believed to be the reason for increasing HoLEP efficiency and reducing total operative time and blood loss [21,25]. The presence of intraoperative bleeding is one of the factors that can prolong the duration of surgery. The importance of the ability to achieve hemostasis is required to speed up the intraoperative duration. This Moses technology has better hemostasis capability allowing a lesser energy used by the surgical operator. Moreover, longer intraoperative duration on the use of Moses HoLEP could also be due to the factor of surgical operator skill. The interaction between the laser fiber and prostate tissue is crucial for achieving enucleation. The goals of HoLEP are to rapidly identify the prostate capsule, maintain the surgical field, and maintain hemostasis during the procedure [26]. The acceleration of enucleation time in

Moses HoLEP can also be explained that the enucleation efficiency in standard HoLEP was 1.05 g/min but increased to 1.75 g/min after using Moses technology [11]. This meta-analysis reported the result that Moses HoLEP had a faster time to hemostasis. Another study reported the use of Moses HoLEP accelerated hemostasis by 40% compared to standard HoLEP [7]. Another interesting result was also derived from our meta-regression analysis which Moses HoLEP showed an increasing advantage over standard HoLEP with the increasing of prostate size. This finding was also in accordance with multivariate analysis in a 1-year retrospective study from Large et al. which involved 150 patients. The study reported that for every 10g increase in prostate gland size, approximately 40% additional time is required to achieve hemostasis with standard 550 μ HoLEP. However, this hemostasis time was 3.9 times faster when using laser technology with Moses laser modulation [7]. Moreover, laser use time was significantly shorter in the Moses HoLEP group than standard HoLEP. Shorter laser use time is associated with significantly faster enucleation and hemostasis times, thus reducing the duration of laser use. A non-significant result was observed in total operative outcome in this study possibly due to the influence of surgical operator in a 3 years of retrospective study from Klett et al. involving 487 patients [15]. They reported that the prolonged duration of total operative time in their study was significantly influenced by the surgical operator experience and skill in which the operator in their study performing Moses HoLEP procedure was a trainee. Moreover, we also did not include study from Assmus et al. in the analysis of total operative time because this study did not represent net operative time of Moses HoLEP procedure which the enucleation time and morcellation time comprised only 48.5% from the total operative time and many concurrent surgeries prolonged the total operative time [27]. Additionally, the total operative time analysis in this study possessed significant publication bias therefore the result was not conclusive.

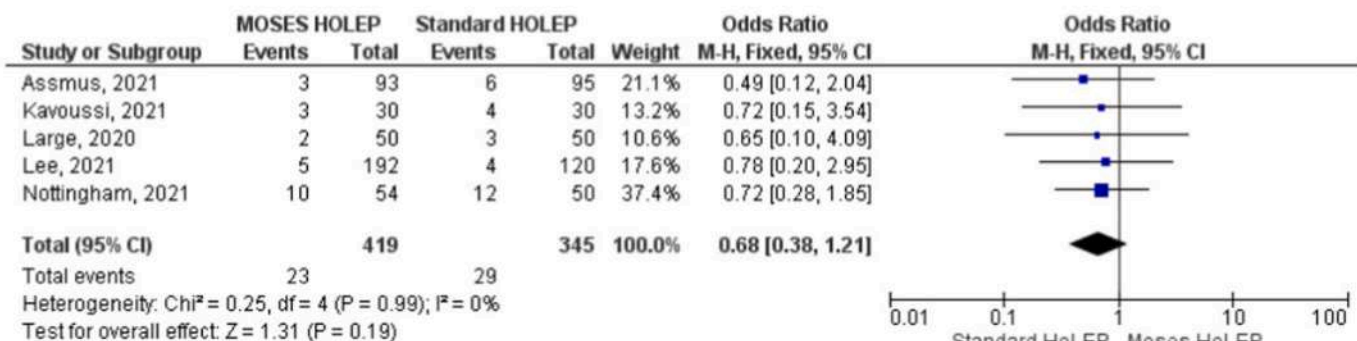
The assessment of postoperative outcome comparison was also performed in this study. Lower mean postvoid residual volume was noted in Moses HoLEP group. This result could provide interesting evidence which Moses HoLEP group may represent favorable postoperative outcome compared to standard HoLEP. This is possibly due to the shorter intraoperative time and decreased intraoperative bleeding which may ease the surgeon to perform a better prostate enucleation with better visualization. The advantage of better intraoperative procedure may result in better postoperative outcome in BPH patients undergoing Moses HoLEP.

Moreover, the complication rates were also evaluated in this study. In terms of bleeding related outcome, Moses HoLEP did not significantly different compared to standard HoLEP. Hemoglobin change was important parameter to be evaluated because this outcome was associated to bleeding related complications and may determine the need for blood transfusion. The overall complications are higher in standard HoLEP patient compared to Moses HoLEP even though the result was not significant. This result suggested that Moses HoLEP did not possess safety issues when compared to standard HoLEP. When sub-grouped to Clavien-Dindo classification, grade 3 complications requiring hospitalization were higher in standard HoLEP group although the result was not significant. The observed complications ranged from not requiring hospitalization such as urinary tract infection, cystitis to requiring hospitalization such as hematuria, urethral stricture, and bladder neck contracture.

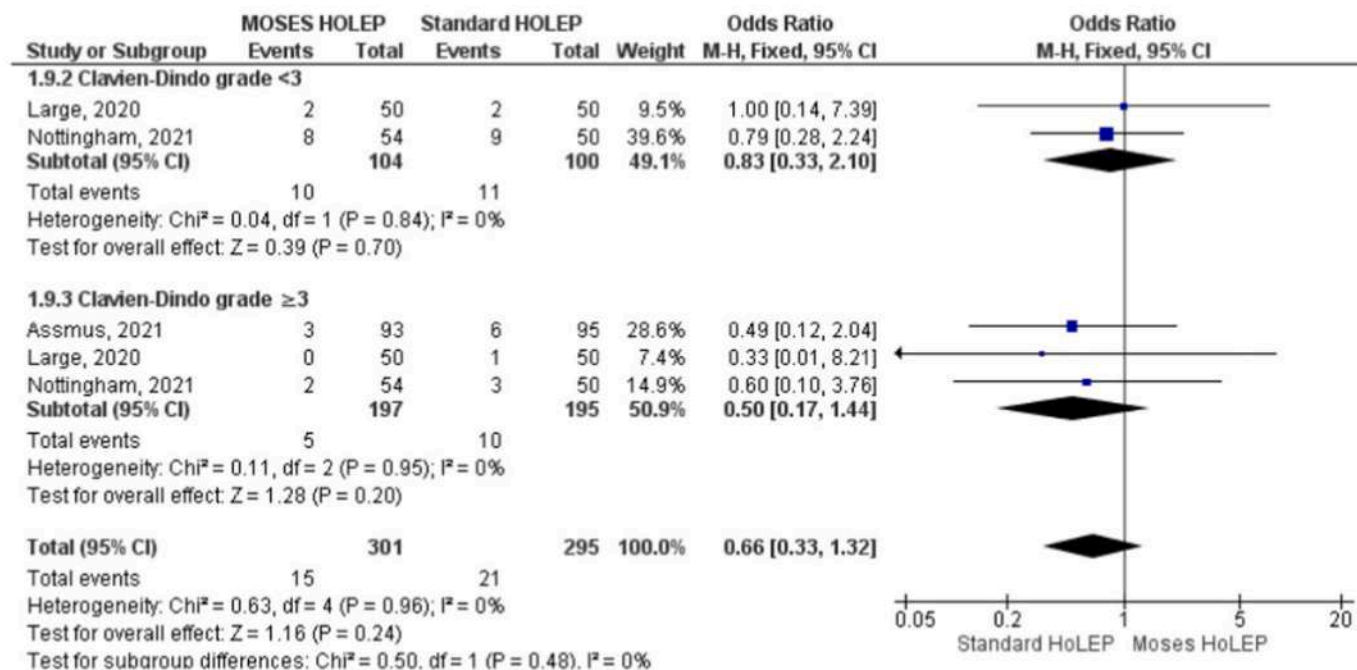
The cost-analysis in this study was not able to be quantitatively assessed. However, one of included studies reported the cost comparison between Moses HoLEP and standard HoLEP [16]. They reported that the use of Moses HoLEP demonstrated significant hospital cost-savings of \$840 per case of one initial surgical episode compared to standard HoLEP. In terms of visits and readmissions, Moses HoLEP also demonstrated hospital cost saving by \$3220. Most of the Moses HoLEP patients who readmitted in ED were minor and did not require admission. Overall, Moses HoLEP represents a cost saving of \$747 lower compared to standard HoLEP. The cost-saving of Moses HoLEP was possibly due to

Complications outcome

Overall Complication



Clavien-Dindo classification outcome



Changes in hemoglobin

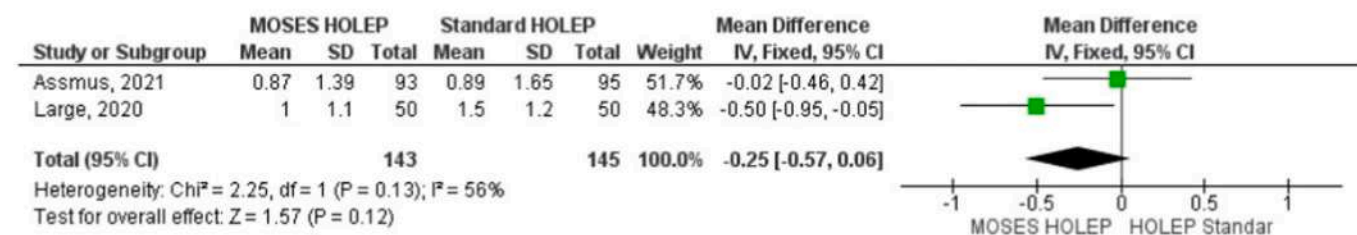
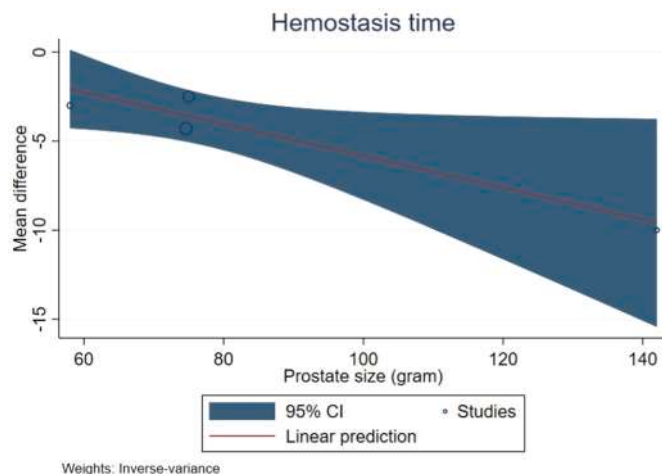


Fig. 4. Forest plot of complications outcome consisted of overall complication, Clavien-Dindo classification outcome, changes in hemoglobin.

Table 3

Meta regression between intraoperative characteristic and prostate size (gram).

Outcome	Coefficient	SE	95% Confidence Interval		P value
Enucleation time	-0.04497	0.0838	-0.2093	0.1193	0.592
Hemostasis time	-0.0894	0.044	-0.176	-0.0023	0.044^a
Laser use time	-0.198	0.1376	-0.4686	0.0710	0.149

^a Significant, SE: standard error.**Fig. 5.** Meta regression of hemostasis time and prostate size.

shorter intraoperative procedure times which leads to reduced medical and drugs supplies cost.

This study provided evidence on the enhanced efficacy and considerable safety of Moses HoLEP compared to standard HoLEP. Moses HoLEP represents a more effective operative procedure with promising outcome. This finding may shift future direction in the use of HoLEP into Moses HoLEP in the hope to optimize outcome in large BPH patients. This new technology will help surgeons to fulfill patient demand for important treatment, provide superior clinical outcomes, and elevate their practices. The practice of same-day discharge for BPH patients by using Moses HoLEP technology may also be fulfilled. The nature of lower cost in the use of Moses HoLEP may relieve the burden of the hospital in the service of large BPH treatment.

This systematic review is not without limitations. Firstly, only 2 RCT studies were included in this study and the other 5 studies were retrospective studies therefore the result of this study was still influenced under the nature of retrospective studies. Moreover, the level of evidence is higher for RCT studies compared to observational studies. Secondly, the influence of surgeon's skill and experience have not been able to be controlled in this study. Thirdly, the quantitative analysis of cost for the Moses HoLEP technology has not been able to be carried out in this systematic review due to limitation of primary thus future suggestion regarding cost analysis needs to be performed in future studies.

5. Conclusion

Moses HoLEP showed superiority compared to standard HoLEP. This study stresses the advantage of Moses HoLEP over standard HoLEP in intraoperative, postoperative and complications outcome. Moses HoLEP significantly provided shorter enucleation time, shorter hemostasis time and shorter laser use time. Moses HoLEP also possessed significantly lower PVR. There were no safety issues in Moses HoLEP compared with standard HoLEP.

Ethics committee approval

A systematic review does not require an ethical approval. The protocol of this systematic review was registered in PROSPERO (CRD42021266151)

Financial Support

None.

Informed consent

This review does not need an informed consent statement.

Author contribution statement

Research conception and design: Muhammad Zaniar Ramadhani, Yudhistira Pradnyan Kloping, Ilham Akbar Rahman. **Data acquisition:** Muhammad Zaniar Ramadhani, Yudhistira Pradnyan Kloping, Ilham Akbar Rahman, Niwanda Yogiswara. **Statistical analysis:** Muhammad Zaniar Ramadhani, Ilham Akbar Rahman, Niwanda Yogiswara. **Data analysis and interpretation:** Muhammad Zaniar Ramadhani, Yudhistira Pradnyan Kloping, Ilham Akbar Rahman, Johan Renaldo, Soetojo. **Drafting of the manuscript:** Muhammad Zaniar Ramadhani, Ilham Akbar Rahman. **Critical revision of the manuscript:** Muhammad Zaniar Ramadhani, Yudhistira Pradnyan Kloping, Ilham Akbar Rahman, Niwanda Yogiswara, Johan Renaldo, Soetojo. **Obtaining funding:** Not applicable. **Administrative, technical, or material support:** Muhammad Zaniar Ramadhani. **Supervision:** Johan Renaldo, Soetojo. **Approval of the final manuscript:** Muhammad Zaniar Ramadhani, Ilham Akbar Rahman, Yudhistira Pradnyan Kloping, Johan Renaldo, Soetojo.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Consent

A systematic review does not require informed consent.

Registration of research studies

Name of the registry: PROSPERO, Research Registry.

Unique Identifying number or registration ID: CRD42021266151 (PROSPERO), [reviewregistry1403](https://www.crd.york.ac.uk/prosp/registry/1403) (Research registry).

Hyperlink to your specific registration (must be publicly accessible and will be checked): PROSPERO: https://www.crd.york.ac.uk/prosp/ero/display_record.php?RecordID=266151 Resarch Registry: <https://www.researchregistry.com/register-now#registryofsystematicreviewsmeta-analyses/registryofsystematicreviewsmeta-analysesdetails/62d5b21d704f1f001f4d4938/>

Guarantor

Johan Renaldo.

Declaration of competing interest

All contributing authors have no conflicts of interest to declare. The signed ICMJE forms of each author were uploaded to the online system.

Acknowledgements

none.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.amsu.2022.104280>.

References

- [1] T.C. Fenter, M.J. Naslund, M.B. Shah, M.T. Eaddy, L. Black, The cost of treating the 10 most prevalent diseases in men 50 years of age or older, *Am. J. Manag. Care* 12 (4) (2006) S90.
- [2] J.T. Wei, E. Calhoun, S.J. Jacobsen, Urologic diseases in America project: benign prostatic hyperplasia, *J. Urol.* 173 (4) (2005) 1256–1261.
- [3] G.I. Russo, S. Cimino, T. Castelli, V. Favilla, M. Gacci, M. Carini, et al., Benign prostatic hyperplasia, metabolic syndrome and non-alcoholic fatty liver disease: is metaflammation the link? *Prostate* 76 (16) (2016) 1528–1535.
- [4] Y.-L. Jiang, L.-J. Qian, Transurethral resection of the prostate versus prostatic artery embolization in the treatment of benign prostatic hyperplasia: a meta-analysis, *BMC Urol.* 19 (1) (2019) 1–8.
- [5] A.M. Elshal, H.M. Elmansy, M.M. Elhilali, Feasibility of holmium laser enucleation of the prostate (HoLEP) for recurrent/residual benign prostatic hyperplasia (BPH), *BJU Int.* 110 (11c) (2012) E845–E850.
- [6] N.L. Kavoussi, N. Nimmagadda, J. Robles, C. Forbes, A. Wang, B. Stone, et al., MOSESTM technology for holmium laser enucleation of the prostate: a prospective double-blind randomized controlled trial, *J. Urol.* 206 (1) (2021), 104–8. Available from: <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed&NEWS=N&AN=634392142>.
- [7] T. Large, C. Nottingham, C. Stoughton, J. Williams, A. Krambeck, Comparative study of holmium laser enucleation of the prostate with MOSES enabled pulsed laser modulation, *Urology* 136 (2020) 196–201 [Internet], <http://www.elsevier.com/locate/urology>.
- [8] M.J. Page, J.E. McKenzie, P.M. Bossuyt, I. Boutron, T.C. Hoffmann, C.D. Mulrow, et al., The PRISMA 2020 statement: an updated guideline for reporting systematic reviews, *Int. J. Surg.* 88 (2021), 105906.
- [9] B.J. Shea, B.C. Reeves, G. Wells, M. Thuku, C. Hamel, J. Moran, et al., Amstar 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both, *Br. Med. J.* 358 (2017).
- [10] N. Kavoussi, N. Miller, A comparison of traditional holmium and moses lasers for prostatic enucleation in a single patient, *J. Urol.* 201 (4 Supplement 1) (2019) e166. Available from: <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed20&NEWS=N&AN=629386647>.
- [11] A. Nevo, K.S. Faraj, S.M. Cheney, J.P. Moore, K.L. Stern, M.R. Humphreys, et al., Holmium laser enucleation of the prostate using Moses 2.0 vs non-Moses: a randomised controlled trial, *BJU Int.* 127 (5) (2021) 553–559. Available from: [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1464-410X](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1464-410X).
- [12] C. Nottingham, T. Large, D. Agarwal, C. Stephens, M. Rivera, A. Krambeck, Outcomes for patients undergoing holmium laser enucleation of the prostate with newly-optimized moses technology, *J. Urol.* 203 (Supplement 4) (2020), e1284. Available from: <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed21&NEWS=N&AN=632061126>.
- [13] T. Large, C. Nottingham, C. Stoughton, J. Williams, A. Krambeck, N.L. Kavoussi, et al., Comparative study of holmium laser enucleation of the prostate with MOSES enabled pulsed laser modulation, *Urology* 136 (1) (2020) 196–201. Available from: <http://www.elsevier.com/locate/urology>.
- [14] M.A. Assmus, M.B. Ganesh, M.S. Lee, T. Large, A.E. Krambeck, Contemporary outcomes for patients undergoing concurrent surgeries at the time of holmium laser enucleation of the prostate before and after moses 2.0 BPH mode, *J. Endourol.* (2021), 35(S3):S8–13. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85121768358&doi=10.1089%2Fend.2021.0531&partnerID=40&md5=a9cc5836d14f28c489f8b1a7d7051f57>.
- [15] D.E. Klett, B. Baird, C.T. Ball, C.D. Dora, Does MOSES pulse modulation reduce short-term catheter reinsertion following holmium laser enucleation of the prostate? *Investig. Clin. Urol.* 62 (6) (2021 Nov) 666–671.
- [16] M.S. Lee, M. Assmus, D. Agarwal, T. Large, A. Krambeck, A cost comparison of holmium laser enucleation of the prostate with and without Moses™, *Urol. Pract.* 8 (6) (2021) 624–629.
- [17] G.A. Wells, B. Shea, D. O’Connell, J. Peterson, V. Welch, M. Losos, et al., The Newcastle-Ottawa Scale (NOS) for Assessing the Quality of Nonrandomised Studies in Meta-Analyses, 2000. Oxford.
- [18] A.D. Martin, R.N. Nunez, M.R. Humphreys, Bleeding after holmium laser enucleation of the prostate: lessons learned the hard way, *BJU Int.* 107 (3) (2011) 433–437.
- [19] M.H. Lee, H.J. Yang, D.S. Kim, C.H. Lee, Y.S. Jeon, Holmium laser enucleation of the prostate is effective in the treatment of symptomatic benign prostatic hyperplasia of any size including a small prostate, *Korean J. Urol.* 55 (11) (2014 Nov) 737–741.
- [20] A. Nevo, K.S. Faraj, S.M. Cheney, J.P. Moore, K.L. Stern, M.R. Humphreys, et al., Comparison of newly optimized moses technology vs standard holmium:YAG for endoscopic laser enucleation of the prostate, *J. Endourol.* 35 (9) (2021) 1393–1399. Available from: <http://www.liebertonline.com/end>.
- [21] A. Ibrahim, S. Badaan, M.M. Elhilali, S. Andonian, Moses technology in a stone simulator, *Can. Urol. Assoc. J.* 12 (4) (2018) 127.
- [22] J.W. Dushinski, J.E. Lingeman, M.M. Elhilali, S. Badaan, A. Ibrahim, S. Andonian, High-speed photographic evaluation of holmium laser, *J. Endourol.* 12 (2) (1998) 177–181.
- [23] E. Ventimiglia, O. Traxer, What is moses effect: a historical perspective, *J. Endourol.* 33 (5) (2019) 353–357.
- [24] K.L. Stern, M. Monga, The Moses holmium system-time is money, *Can. J. Urol.* 25 (3) (2018) 9313–9316.
- [25] P. Mirilas, A. Mentessidou, Microsurgical subinguinal varicocelectomy in children, adolescents, and adults: surgical anatomy and anatomically justified technique, *J. Androl.* 33 (3) (2012) 338–349. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84862009300&doi=10.2164%2Fjandrol.111.013052&partnerID=40&md5=ee1b6b173acaf8d854334ff249ef158f>.
- [26] J.A. Moody, J.E. Lingeman, Holmium laser enucleation of the prostate with tissue morcellation: initial United States experience, *J. Endourol.* 14 (2) (2000) 219–223.
- [27] M.A. Assmus, T. Large, A. Krambeck, Holmium laser enucleation of the prostate efficiency by prostate gland size: is there a sweet spot? *Uro* 1 (4) (2021) 202–208.