



REVISTA DE  
GASTROENTEROLOGÍA  
DE MÉXICO

[www.elsevier.es/rgmx](http://www.elsevier.es/rgmx)



ORIGINAL ARTICLE

Experience in geriatric patients at the Gastrointestinal Surgery Department of the *Hospital Español*, Mexico, 2013–2019. Five-year experience in GI surgery in geriatric patients<sup>☆</sup>



J. Fernández-Álvarez\*, V. Cores-Ogando, B. Rodríguez-Bustos, R. Turrent-Pinedo

*Servicio de Gastrocirugía, Hospital Español de México, Mexico City, Mexico*

Received 20 November 2020; accepted 30 August 2021

Available online 3 May 2022

KEYWORDS

Surgery;  
Geriatrics;  
Surgery in the elderly;  
Clavien–Dindo;  
Older adult

Abstract

**Introduction:** The aging of the population is one of the most widely studied and impactful social phenomena of this century. Up to 25% of all emergency hospital admissions can be due to diseases that require general surgery.

**Aims:** To describe the experience at the Department of Gastrointestinal Surgery of the *Hospital Español*, Mexico, in patients above 65 years of age.

**Materials and methods:** A retrospective, observational, analytic, and cross-sectional study was conducted that included 595 medical records of geriatric patients that underwent surgical procedures, within the time frame of November 2013 and February 2019.

**Results:** A total of 52% (309) of the patients were men and 48% (286) were women. Mean patient age was 75.38 years, with a mode of 73 years, and a maximum age of 100 years. Mean hospital stay was 4.5 days. Postoperative complications presented in 12.77% of the patients, 3.02% of which were severe. Reoperation was required in 13 patients (0.02%). The perioperative mortality rate was 2.02%.

**Conclusions:** The morbidity and mortality rates of the procedures that corresponded to general surgery in our case series were similar to those reported in the literature. A statistically significant number of patients underwent laparoscopic surgery, within the study period.

© 2022 Published by Masson Doyma México S.A. on behalf of Asociación Mexicana de Gastroenterología. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<sup>☆</sup> Please cite this article as: Fernández-Álvarez J, Cores-Ogando V, Rodríguez-Bustos B, Turrent-Pinedo R, Experiencia en pacientes geriátricos del servicio de Gastrocirugía en el Hospital Español de México 2013–2019. Gastrocirugía en pacientes geriátricos: experiencia de 5 años, Revista de Gastroenterología de México. 2023;88:220–224.

\* Corresponding author.

E-mail address: [gastroclinicamx@gmail.com](mailto:gastroclinicamx@gmail.com) (J. Fernández-Álvarez).

**PALABRAS CLAVE**

Cirugía;  
Geriatría;  
Cirugía en ancianos;  
Clavien–Dindo;  
Adulto mayor

**Experiencia en pacientes geriátricos del servicio de Gastrocirugía en el Hospital Español de México 2013–2019. Gastrocirugía en pacientes geriátricos: experiencia de 5 años**

**Resumen**

*Introducción y objetivo:* El envejecimiento de la población es uno de los fenómenos sociales más estudiados y de mayor impacto de este siglo. Hasta el 25% de todos los ingresos de urgencia al hospital pueden ser por patologías que corresponden a cirugía general.

*Objetivos:* Mostrar la experiencia del Servicio de Gastrocirugía del Hospital Español de México en pacientes mayores de 65 años.

*Material y Métodos:* Se realizó un estudio observacional, retrospectivo, transversal y analítico, en donde se incluyeron 595 expedientes de pacientes geriátricos que fueron sometidos a procedimientos quirúrgicos de noviembre 2013 a febrero 2019.

*Resultados:* 52% (309) de hombres y 48% (286) mujeres, con media de edad de 75.38 años, moda de 73 años, con una máxima de 100 años. La estancia intrahospitalaria promedio fue de 4.5 días. Las complicaciones postquirúrgicas se presentaron en el 12.77%, de ellas 3.02% fueron graves. La reoperación fue necesaria en 13 pacientes (0.02%). La mortalidad perioperatoria fue de 2.02%.

*Conclusiones:* Encontramos una morbi-mortalidad similar a la reportada en la literatura en los procedimientos que corresponden a Cirugía General en nuestra serie y una proporción significativa de pacientes operados por vía laparoscópica en el periodo estudiado.

© 2022 Publicado por Masson Doyma México S.A. en nombre de Asociación Mexicana de Gastroenterología. Este es un artículo Open Access bajo la licencia CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

**Introduction and aim**

Aging of the population is one of the most widely studied and impactful social phenomena of this century. According to the World Health organization (WHO), the twentieth century produced a longevity revolution. Mean life expectancy at birth increased 20 years, since 1950, reaching 66 years, and is predicted to increase another 10 years for the year 2050.

According to the information reported in 2017 by the *Instituto Nacional de las Personas Adultas Mayores (INAPAM)*, Mexico had a total population of 112,336,538 persons, of whom 12,973,411 were over 60 years of age. In that age group, 53.9% were women, and 46.1% were men.

Geriatric patients that undergo surgical procedures usually require more care than young adults, given that they more frequently present with postoperative complications, as well as reduced functioning and loss of independence in daily life. Between 2010 and 2050, surgical procedures corresponding to general surgery, in the geriatric population, are projected to increase by 18% in the United States.<sup>1</sup>

The number of patients that present with a disease requiring surgery increases with age. Up to 25% of emergency hospital admissions can be due to diseases that require general surgery. Fragility is an important potential risk factor, but it is difficult to control in emergency situations.<sup>2</sup>

In a retrospective review of general surgery procedures performed on patients 70 years of age or older, 15% of the cases were emergencies. Intra-abdominal infection, bowel obstruction, incarcerated hernia, gastrointestinal bleeding were the main indications for surgery. The authors of the review found that postoperative morbidity, mortality rates

were significantly higher for emergency procedures, (31%, 20%, respectively) than for elective procedures (6.8%, 1.9%, respectively), in the same age group.<sup>3</sup>

In a prospective case series, from the United Kingdom that included 1,111 patients over 65 years of age, the mortality rate was 3.5%, and it doubled in the patients >74 years of age. The most commonly performed elective procedures were inguinal hernia repair, colectomy, and cholecystectomy.<sup>4</sup> The aim of the present study was to describe the experience at the Department of Gastrointestinal Surgery of the *Hospital Español*, Mexico, with patients above 65 years of age (geriatric patients).

**Materials and methods**

A retrospective, observational, analytic, and cross-sectional study was conducted. The inclusion criteria included all geriatric patients (over 65 years of age) that underwent elective or emergency surgical procedures, within the time frame of November 2013 and February 2019, at the Gastrointestinal Surgery Department of the *Hospital Español*, Mexico. A total of 964 medical records were reviewed and 369 were excluded because they did not meet the inclusion criteria.

**Statistical analysis**

The Excel program was utilized to create the database and carry out the basic statistical analysis (mean, median, mode, minimum, and maximum values).

**Table 1** Distribution of the surgical approach in cholecystectomies.

<i>Cholecystectomy</i>	228
Laparoscopic	226
Conversion	2

**Table 2** Procedures performed to treat abdominal wall hernias.

<b>Hernias de pared abdominal</b>	151
<i>Plastía inguinales</i>	
Plastía abierta	76
Plastía laparoscópica	43
<i>Plastías de pared</i>	
Abierta	15
Laparoscópica	3
Plastía umbilical	10
<i>Plastía femoral</i>	
Abierta	3
Laparoscópica	1

**Table 3** Procedures performed for treating intestinal disease.

<b>Small bowel procedures</b>	30
<i>Intestinal resection with primary anastomosis</i>	18
Adhesiolysis	6
Open	6
Laparoscopic	2
<i>Intestinal transit restoration (enteroenterostomy)</i>	4

**Table 4** Procedures performed to treat upper gastrointestinal diseases.

<i>Upper gastrointestinal tract procedures</i>	19
Partial gastrectomy	6
Laparoscopic fundoplication (type III and IV hiatal hernia)	5
Gastrostomy	5
Laparoscopic duodenal ulcer surgical treatment	3

**Table 5** Surgical procedures performed to treat diseases of the colon.

<b>Colonic disease</b>	71
<i>Right hemicolectomy</i>	
Open	7
Laparoscopic	6
<i>Left hemicolectomy</i>	
Laparoscopic	10
Open	3
<i>Hartmann procedure</i>	
Open	8
Laparoscopic	4
<i>Laparoscopic sigmoidectomy</i>	11
<i>Laparoscopic abscess drainage due to diverticulitis</i>	5
<i>Laparoscopic lower anterior resection</i>	4
<i>Total colectomy</i>	3
<i>Colostomy</i>	3
<i>Primary repair of colonic perforation</i>	3

## Results

During the study period, 4,534 procedures corresponding to general surgery were performed, 595 (13%) of which were carried out in patients above 65 years of age. Fifty-two percent (309) of the patients were men and 48% (286) were women. Mean patient age was 75.38 years, with a mode of 73 years and a maximum age of 100 years. The most frequent comorbidities were high blood pressure, at 45%; diabetes, at 44%; and heart disease (arrhythmias, ischemic heart disease, heart failure) at 11%. Twenty-seven percent of the patients were smokers at the time of hospitalization, and 40% had undergone one or more previous surgeries.

The patients had the following American Society of Anesthesiologists (ASA) classifications: ASA I 0.34%, ASA II 81.07%, ASA III 15.8%, ASA IV 2.69%, and ASA V 0.17%; and the risk for thromboembolism, utilizing the Caprini risk scale, modified by the American College of Chest Physicians (ACCP), was low at 76.97%, intermediate at 18.5%, and high at 4.87%.

In our patients, 61.68% of the surgeries were emergency procedures and 38.32% were elective.

The most frequent surgical procedures in our population were: laparoscopic cholecystectomy (228), with 2 conversions to open surgery (Table 1); abdominal wall repair (151), of which 119 were inguinal hernia repair (only 43 were laparoscopic), 18 were ventral hernia repair, and 14 were others (Table 2). The group of procedures in third place in frequency was related to colonic disease, with a total of 71 procedures, and more than half were performed laparoscopically. Laparoscopic appendectomy was in fourth place in frequency, with 46 surgeries and no conversions. Another group of procedures was performed on the small bowel, of which intestinal resection with anastomosis was the main surgery, carried out on a total of 18 patients (Table 3). Upper gastrointestinal surgery performed within the study period included partial gastrectomy, laparoscopic fundoplication, and the surgical treatment of duodenal ulcer perforation (Table 4). Seventy-one procedures related to colonic dis-

ease were carried out, the most common of which were right hemicolectomy, left hemicolectomy, the Hartmann procedure, and sigmoidectomy (Table 5). Other relatively frequent surgeries were diagnostic laparoscopy, in the study of ascites and malignant diseases, as well as exploratory laparotomy. The rest of the procedures were performed 1 or 2 times, within the 5-year period, and were grouped as miscellaneous surgeries (78 procedures); they included the surgical treatment of Zenker's diverticulum, myotomy for achalasia, etc. (Table 6).

Mean intrahospital stay was 4.5 days, with a maximum of 61 days.

Postoperative complications presented in 12.77% of the patients, 3.02% of which were severe (Clavien-Dindo III and IV). The most frequent of those complications were bleeding, residual abscesses, and fistulas. Reoperation was required in 13 patients (0.02%) and the mortality rate was 2.02% (Table 7).

**Table 6** Procedures performed to treat other diseases.

<b>Other procedures</b>	<b>98</b>
<i>Diagnostic laparoscopy</i>	6
<i>Laparoscopic biopsy</i>	6
<i>Drainage of abdominal wall hematoma</i>	3
<i>Exploratory laparotomy</i>	3
<i>Splenectomy</i>	
Open	1
Laparoscopic	1
<i>Miscellaneous (others)</i>	78

**Table 7** Distribution of the postoperative complications, according to the Clavien–Dindo classification.

<i>Postoperative complications</i>	76
I	35
II	11
IIIa	5
IIIb	8
IVa	2
IVb	3
V	12

## Discussion

Currently, 95% of cholecystectomies in the United States are performed laparoscopically. In our experience, similar to that reported in the literature, the majority of cases of acute cholecystitis in older adults, were resolved through laparoscopy, with a very low conversion rate. Therefore, it was not possible to compare the complications between the open procedure and the laparoscopic technique. However, the general complication rate was comparable to that described in the literature.<sup>5,6</sup>

On the other hand, the open procedure in hernia treatment, in our population, was more widely used than the laparoscopic approach.

A similar recurrence rate for open and laparoscopic procedures is described in the literature. The laparoscopic approach has the advantages of a lower infection rate, shorter hospital stay, and less postoperative pain, but there is a slight increase in perioperative complications. The authors of a review hypothesize that said complications could be secondary to a higher rate of accidental enterotomies during adhesiolysis.<sup>7</sup>

Regarding colonic resections, retrospective case series have shown a decrease in postoperative complications in laparoscopy groups, and it is more pronounced when the analysis is limited to patients above 70 years of age.<sup>8</sup> In our experience, the trend to carry out a higher number of laparoscopic procedures coincides with that reported in the literature. In more recent studies, the non-inferiority of laparoscopic resection has been shown, from the oncologic perspective, in patients over 80 years of age.<sup>9</sup>

## Conclusions

A multidisciplinary approach that includes geriatricians, cardiologists, psychiatrists, internists, and nephrologists, with the services of physical therapy and rehabilitation and respiratory therapy, in the preoperative and postoperative periods, is important so that access to surgical procedures is not necessarily limited by age. That approach, together with the reintegration of the older adult into the community within the shortest time possible and in the best clinical condition, has resulted in a majority of laparoscopic procedures being performed at our service.

Laparoscopic surgery in older adults is safe and desirable in the majority of cases, enabling faster reintegration of the advanced-age patient into his or her daily life.

## Ethical considerations

Informed consent was not requested for the publication of this case series because it is an article that includes no personal data that could identify the patients.

The research follows the current bioethics research regulations but given that no experiments were performed on humans or animals, approval by the institutional ethics committee was not required.

The authors declare that it is impossible to identify any of the patients referred to in this study, through any of the data contained in the article.

## Financial disclosure

No financial support was received in relation to this article.

## Conflict of interest

The authors declare that there is no conflict of interest.

## References

- Mohanty S, Rosenthal RA, Russell MM, et al. Optimal perioperative management of the geriatric patient: a best practices guideline from the American College of Surgeons NSQIP and the American Geriatrics Society. *J Am Coll Surg.* 2016;222:930–47, <http://dx.doi.org/10.1016/j.jamcollsurg.2015.12.026>.
- Desserud KF, Veen T, Søreide K. Emergency general surgery in the geriatric patient. *Br J Surg.* 2016;103:e52–61, <http://dx.doi.org/10.1002/bjs.10044>.
- Keller SM, Markovitz LJ, Wilder JR, et al. Emergency surgery in patients aged over 70 years. *Mt Sinai J Med.* 1987;54:25–8. PMID: 3494913.
- Barlow AP, Zarifa Z, Shillito RG, et al. Surgery in a geriatric population. *Ann R Coll Surg Engl.* 1989;71:110. PMID: 2705717.
- Antoniou SA, Antoniou GA, Koch OO, et al. Meta-analysis of laparoscopic vs open cholecystectomy in elderly patients. *World J Gastroenterol.* 2014;20:17626, <http://dx.doi.org/10.3748/wjg.v20.i46.17626>.
- Annamaneni RK, Moraitis D, Cayten CG. Laparoscopic cholecystectomy in the elderly. *JLS.* 2005;9:408–10. PMID: 16381355.
- Sauerland S, Walgenbach M, Habermatz B, et al. Laparoscopic versus open surgical techniques for ventral or incisional her-

- nia repair. *Cochrane Database Syst Rev.* 2011;16:CD007781, <http://dx.doi.org/10.1002/14651858.CD007781.pub2>.
8. Fleshman JW, Nelson H, Peters WR, et al. Early results of laparoscopic surgery for colorectal cancer. Retrospective analysis of 372 patients treated by Clinical Outcomes of Surgical Therapy (COST) Study Group. *Dis Colon Rectum.* 1996;39:553–8, <http://dx.doi.org/10.1007/BF02053806>.
9. Franco I, de'Angelis N, Canoui-Poitrine F, et al. Feasibility and safety of laparoscopic right colectomy in oldest-old patients with colon cancer: results of the CLIMHET Study Group. *J Laparoendosc Adv Surg Tech.* 2018;28:1326–33, <http://dx.doi.org/10.1089/lap.2018.0040>.