Outpatient management of uncomplicated appendicitis. A Cohort study

Carlos Enrique Luna Guerrero M.D.
César Oropeza Duarte M.D.
Daniela Liliana Suárez Velázquez M.D.
Raúl Buenrostro Espinosa M.D.
Dianalaura Almada Manzo M.D.
Yocelyn Scarlet Martínez Gómez M.D.
Karla García Morán M.D.
María Fernanda García Colunga M.D.
Quitzia Libertad Torres Salazar M.D.

Durango, Mexico.

Original Article

General Surgery

OPEN ACCESS

BACKGROUND. Acute appendicitis is the most frequent cause of emergency surgery, and it is estimated that 5-20% of the population will suffer from it at some point. Outpatient appendectomy can be performed in selected cases without increasing the incidence of complications and also reducing the costs involved. Objective: To know the safety and cost / effectiveness of outpatient management from postoperative appendectomy patients in uncomplicated appendicitis cases. Material and methods: An observational, analytical study of a prospective cohort, carried out at the Hospital General Regional No 1 IMSS Obregón, Sonora. Postoperative patients with appendectomy, secondary to uncomplicated acute appendicitis, were included. The safeness of outpatient management was analyzed, using the presence or absence of complications as an indicator. Likewise, a cost / effectiveness estimate of the outpatient procedure was made. Results: A total of 63 appendectomies were performed; 22 with outpatient management (34%) and 41 with conventional management (66%). There were no differences in the frequency of complications (p = 0.57); the variable that represented the greatest risk for complications was the body mass index RR 1.24 (0.22 - 6). The savings for the institute according to outpatient management is $15,533 Mexican pesos, per patient. Conclusions: There is no difference in the complications' presence in outpatient management of appendectomy secondary to uncomplicated appendicitis compared to conventional management, so it is considered a secure strategy. The decrease in the length of hospital stay, in addition to being a cost / effective procedure, has an impact on reducing the probability of nosocomial infection.

KEY WORDS: Acute appendicitis, outpatient management.

Introduction

Acute appendicitis represents the most common indication for emergency non-traumatic abdominal surgery in the world. It is an entity that occurs most frequently between the second and third decades of life. The risk of presenting it is 16.33% in men and 16.34% in women. Its annual incidence is 139.54 per 100,000 inhabitants; it is associated with overweight in 18.5% and obesity in 81.5% (1). It is the most frequent cause of acute abdominal pain and the most frequently performed emergency operation in the world. Thus, it is estimated that 5-20% of the population will suffer from it at some point in their life (2). In the United States, 250,000 cases of acute appendicitis occur per year, and it is estimated that hospitalization for it represents a cost of 1.5 billion dollars annually in its diagnosis and treatment (3). In August 2012, in the Official Gazette of Mexico, the Official Mexican Standard (NOM-026-SSA3-2012) for the practice of Major Ambulatory Surgery (MAS), made some contributions about this topic. This (6.2) indicates that some emergency surgery can be included as MAS only when some vital functions are not invalidated or limited in the immediate postoperative period. Furthermore, in the opinion of the surgeon and anesthesiologist responsible for the procedure, it must be established no risks or complications are found in said period (4). In recent years, the number of ambulatory major surgery units has increased, due to the advantages they offer concerning higher productivity, lower costs and greater comfort (5, 6), particularly in the United States, Canada, England and Australia (7). In Mexico, we are far from this percentage, but in the extent that costs and benefits show differences with conventional criteria, outpatient surgery will occupy a relevant place. For this reason, we undertook the task of conducting this study, with the aim of knowing the safety and cost / effectiveness of outpatient management of postoperative appendectomy patients

From the Department of Plastic Surgery at Instituto de Investigación Científica Alpha 0.01, Durango, Mexico. Received on September 7, 2021. Accepted on September 11, 2021. Published on September 16, 2021.

DOI: 10.17605/OSF.IO/HJ3EN

N= 63				
		Outpatient Management n= 22	Conventional management n= 41	*p*
Sex				
	Male	8 (36%)	26 (63%)	*0.07*
	Female	14 (64%)	15 (37%)	
Age*		39 (33-51)	26 (22-36)	*0.01*
BMI*		27 (26 - 32)	32 (28 - 34)	*0.05*

* Data is presented as mean (q25-q75), the comparison between groups was made using the Mann Whitney U test. The chi-square test was used to compare percentages.

Table 1. General characteristics of postoperative patients by uncomplicated appendectomy

for uncomplicated appendicitis, in a second-level hospital.

Methods

With prior authorization from the local ethics and research committee, a prospective and observational cohort study was conducted with patients between the age of 18-60, with a postoperative diagnosis of uncomplicated acute appendicitis. The study was carried out in the general surgery service of a second level care hospital in Northwest Mexico. The sampling was carried out by consecutive cases; patients with neurological disease, diabetes mellitus, HIV, and patients with a body mass index greater than 34.9 and a score greater than 6 on the visual analog pain scale (VAS) were excluded.

Patients received prophylactic antibiotic therapy with third-generation cephalosporin prior to the intervention. The approach was performed according to the surgeon's preference, and the management of the appendicular stump according to the intraoperative findings. The specimen was sent for histopathological study to rule out oncological pathology. During recovery, a liquid diet was started approximately 4 hours after the procedure. Discharge was made within a period of no more than 8 hours after the surgical event. Regarding discharge, they were managed with Ciprofloxacin and NSAIDs. In case of allergies, an antibiotic with a similar spectrum and / or analgesia of similar efficacy was chosen.

The alarm data was explained to each participant before discharge, and the investigators' telephones were provided so that they could be in contact in case of any eventuality. Post-surgical control was carried out one week later in all cases, to remove the stitches in the office. In case of satisfactory evolution, they were given a new consultation after 30 days postoperatively for a new revision of the surgical site and the histopathological report of the piece. After ruling out Malignancy (benign histopathological report), the definitive discharge from the General Surgery service was performed.

N= 63			
	Outpatient Management	Conventional management	*p*
	n= 22	n= 41	
TYPE OF INCISION			
Mc Burney	3 (14%)	11 (27%)	*0.05*
Rockey Davis	15 (68%)	19 (46%)	
Mean	4 (18%	11 (27%)	
SURGICAL TECHNIQUE			
Pouchet	21 (95%)	35 (86%)	*0.480*
Parker Kerr	0 (0%)	3 (7%)	
Halsted	1 (5)	3 (7%)	

* The chi-square test was used to compare percentages.

Table 2. Surgical technique used and most frequent surgical technique in postoperative appendectomy patients.

DOI: 10.17605/OSF.IO/HJ3EN

N= 63	Complications	Without complications	RR (IC95%)	*p*
	n= 5	n= 58		
OUTPATIENT MANAGEMENT	2 (9%)	20 (91%)	1.24 (0.22 - 6.89)	*0.604*
CONVENTIONAL MANAGEMENT	3 (7%)	38 (93%)		
NORMAL BMI	1 (4%)	24 (96%)	2.38 (0.28 - 20)	*0.05*
OVERWEIGHT / OBESITY	4 (10%)	38 (90%)		

* The most frequent complications were surgical wound infection (4.5%) and seroma (4.5%).

Table 3. Complications and risk factors in postoperative appendectomy patients.

Results

A total of 63 patients were included, the outpatient management cohort (OM) corresponded to 34% and the rest corresponded to the control cohort (Table 1). There were no statistically significant differences related to sex. Regarding age, the group mean (OM) was 39 vs. a mean of 26 years of the control group. The body mass index (BMI) was higher in the outpatient group (p = 0.05).

In the group of patients who received conventional management, they were mostly men (63%), the predominant type of incision was Rockey Davis (46%) and the most used surgical technique was Pouchet (86%) (Table No.2). In the group of patients who received outpatient management, 64% were women, the predominant incision was Rockey Davis (68%) and the most used surgical technique was Pouchet (95%).

A contingency table (2x2) was elaborated to determine the relative risk of complication for patients with outpatient management vs. conventional handling. There were no statistically significant differences between both groups (Table No.3). Regarding the body mass index, the RR was 2.38 for the overweight / obese group. Although this does not reach statistical significance (95% CI 0.28-20), differences between groups were identified with the Xi-square test comparison (p = 0.05).

Discussion

The surgical treatment of appendectomy by outpatient modality has been widely discussed. Traditionally, appendicitis has been treated by surgery. However, cases of appendicitis treated with antimicrobials to take it into a cooling phase and after the operation have been described (8). One of the most frequent concerns of performing an outpatient procedure is the possibility of serious complications after discharge from the hospital. In our study, it is observed that ambulatory appendectomy can be performed in selected cases without increasing complications and reducing the costs that it entails. Whereas the authors Meissner and Moore (9), reported postoperative bleeding as the main complication, in our study surgical wound infection and seroma, both in 4.5% of the ambulatory management group, were the main ones.

Outpatient appendectomy can be included in an outpatient surgery program or guide, since there is no statistically significant difference in the number and type of complications that occurred in patients who received conventional and outpatient management. Similar studies confirm the goodness of early discharge (10). However, in appendectomy studies, and even minimally invasive studies, it has not been possible to establish a routine treatment to propose a short stay (11).

Analyzing the comparison between variables and complications of the patients, it was observed that abnormal BMI is related to the number of complications. Likewise, in a study published on acute appendicitis in Buenos Aires, obesity is referred as a risk factor (12). Taking into account that the study population only included 63 patients, future research should consider a larger sample size and also the usage of scales to improve the association between these variables, to provide us more convincing results.

The complications presented in both types of management were statistically non-significant, and the safety for early discharge of postoperative appendectomy patients is demonstrated in well-selected cases. Therefore, a short-stay surgery program can be performed, representing a significant saving for the institution. According to the official federation

DOI: 10.17605/OSF.IO/HJ3EN

gazette the amount will round $15,533.00 per patient and a total of $978,579.00. This, considering the number of patients in this study, the cures and days of hospitalization. Finally, as the research project progresses, the results will undoubtedly be much better.

Conclusion

There are no statistically significant differences between the number and type of complications presented in patients with postoperative appendectomy, secondary to uncomplicated appendicitis, managed on an outpatient basis, and conventional management. The decrease in the number of hospital stay days, in addition to being a cost / effective procedure, has an impact on reducing the probability of nosocomial infection.

Conflicts of interests

Authors declare that there is no conflict of interest, as well as not having received any type of financing for the development of this research.

Ethical considerations

In order to carry out this research project, we had the authorization of the Ethics Committee of Hospital General Regional No. 1 and the specific informed consent for outpatient management.

The researcher undertook to handle all the information collected in this study confidentially, without recording in any document, the personal data or results obtained from the patients.

For all the foregoing, it is verified that the Mexican regulations were respected based on the General Law of Health in terms of health research, specifically in: Article 16: Which establishes the protection of the person privacy into investigation.

References

1. Hernández- Cortez J, de León-Rendón J, Martínez-Luna MS, Guzmán-Ortiz JD, Palomeque-López A, Cruz-López N, José-Ramírez H. Acute appendicitis: literature review Cirujano General 2019; 41 (1): 33-38.
2. Shelton T, McKinlay R, Swchwatz RW. Acute appendicitis: Current diagnosis and treatment. Current Surgery. 2003;60(5):502-5.
3. Luzardo E, Parra N, González L, Viel D. Ambulatory major surgery in patients with acute apendicitis. MEDISAN. 2010;14(7):904.
4. Diario Oficial de la Federación. Norma Oficial Mexicana NOM-026-SSA3-2012, Para la práctica de la cirugía mayor ambulatoria. https://catalogonacional.gob.mx/FichaRegulacion?regulacionId=72449
5. Hernández-Avendaño V, Jiménez-López M, Salazar-Lozano CR. Cirugía mayor ambulatoria: una opción real. Estudio de costo-beneficio en una unidad de segundo nivel. Rev Esp Méd Quir [Internet]. 2017 [citado 3/9/2021]; 22:95-103.
6. Rodríguez-Padilla Á, González-Benjumea P, Morales-Martín G, Escoresca-Suárez I, UtreraGonzález A, Balongo-García R. Abordaje laparoscópico de la hernia inguinal en unidad de cirugía mayor ambulatoria. Cirugía Andaluza. 2017; 28(3):101-105
7. Falcón Hernández A, Navarro Machado VR, Molina Lois RM, Morejón Barroso O, Araña Hernández Y, Reyes Cabrera H. Primer Centro Especializado Ambulatorio en Cuba y sus resultados en tres años de trabajo. Rev Cubana Salud Pública. 2015; ;41(1):130-8.
8. Gahukamble DB, Gahukamble LD. Surgical and pathological basis for interval appendectomy after resolution of appendicular mass in children. J Pediatr Surg 2000;35:424-7.
9. Meissner R, Moore JH. Colecistectomía laparoscópica ambulatoria. En: Moore JH. Cirugía mayor ambulatoria: experiencia para Latinoamérica. Bogotá: Editorial Distribuna, 2005:103-8.
10. Buick RG, Fitzgerald RJ, Courtney D. Early discharge following appendectomy in children. Ann R Coll Surg Engl 1985;67:105-6.
11. Eldridge B, Kimber C, Wolfe R, Galea M, Hutson J. Uptime as a measure of recovery in children postappendectomy. J Pediatr Surg 2003;38:1822-5
12. Jose Luis Cuervo. Apendicitis aguda. Rev. Hosp. Niños (B. Aires) 2014;56(252):15-31 / 15

Quitzia Libertad Torres Salazar
Department of Plastic Surgery
Instituto de Investigación Científica Alpha 0.01
Durango, Mexico
quitzia.torres@gmail.com

 DOI: 10.17605/OSF.IO/HJ3EN