

Abdominal Complications After Lung Transplantation in a Brazilian Single Center

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ABSTRACT

Surgical and nonsurgical abdominal complications have been described after lung transplantation. However, there is limited data on this event in this population. The objective of this study was to analyze the incidence of abdominal complications in patients undergoing lung transplantation at the Heart Institute of the Faculty of Medicine, University of São Paulo (InCor-HCFMUSP) between the years 2003 and 2016. The main causes of abdominal complications were inflammatory acute abdomen (7 patients; 14%), obstructive acute abdomen (9 patients; 18%), gastroparesis (4 patients; 8%), distal intestinal obstruction syndrome (4 patients; 8%), perforated acute abdomen (7 patients; 14%), cytomegalovirus (CMV; 6 patients; 12%), and other reasons (12 patients; 26%). Separating these patients according to Clavien-Dindo classification, we had 21 patients (43%) with complications grade II, 4 patients (8%) with complications grade IIIa, 7 patients (14%) with grade IIIb complications, 7 patients (14%) with grade IV complications, and 10 patients (21%) with grade complications V. In conclusion, abdominal disorders are seriously increased after lung transplantation and correlate with a high mortality. Early abdominal surgical complication has worse prognosis.

LUNG transplantation has become the standard therapy for the treatment of eligible patients with terminal pulmonary disease. The last record published by the International Society for Heart and Lung Transplantation (ISHLT) Registry Report of 2015 showed that 51,440 lung transplantations have been performed up to June 2014 [1].

Surgical and nonsurgical abdominal complications have been described after lung transplantation. However, there is limited data on this event in this population. The work related to this issue shows that they are an important source of morbidity and mortality in lung transplant recipients [2–6], requiring early diagnosis to assess risk factors.

The objective of this study was to analyze the incidence of abdominal complications in patients undergoing lung transplantation at the Heart Institute of the Faculty of Medicine, University of São Paulo (InCor-HCFMUSP), between the years 2003 and 2016.

MATERIAL AND METHODS

This was a retrospective study including all patients undergoing lung transplantation from August 2003 to August 2016 at a single center in the InCor-HCFMUSP.

Patient records in our database were analyzed. The patients were followed up after the transplantation with the aim of identifying abdominal complications, defined as any postoperative condition affecting the gastrointestinal (GI) tract, liver, pancreas, or biliary tract in need of drug therapy, surgery, or endoscopic or radiological testing, and with ≥ 2 according to the Clavien-Dindo classification (Appendix A) [7]. Abdominal complications were classified as early (up to 30 days after transplantation) or late (more than 30 days after transplantation).

We performed statistical analyzes using SPSS 18.0 (SPSS Inc, Chicago, Ill, United States) with a confidence interval of 95% and .05 significance level. For data comparison with normal distribution we carried out test samples Student *t*. The Mann-Whitney test was used for the variables that were not normally distributed. For qualitative variables in 2×2 tables we used Fisher chi-square or exact tests. The results were expressed as mean and standard error of the mean or median and interquartile range for variables that were not normally distributed.

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Table 1. General Population

Number of transplants	274
Gender	
Male	161 (58)
Female	113 (42)
Median age	41.8 ± 15.6
Kind of transplantation	
Bilateral	219 (79)
Unilateral	55 (21)

Note: Results expressed by number and/or percentage; mean age ± standard deviation.

RESULTS

In this study, 274 transplantations were performed. One hundred sixty-one patients (58%) were men, with a mean age of 41.8 ± 15.6 years. The types of transplantations performed were 219 (79%) bilateral and 55 (21%) unilateral, including right and left (Table 1). In our series we had 5 patients who needed to undergo retransplantation. The underlying diseases in our cohort were as follows: cystic fibrosis 63 (23%), pulmonary emphysema 60 (21.9%), bronchiectasis 54 (19.7%), pulmonary fibrosis 48 (17.5%), bronchiolitis 13 (4.7%), lymphangioleiomyomatosis 10 (3.6%), and other 26 (9.6%).

Among all 274 cases, 49 (17.8%) had abdominal complications and 28 (10.2%) died, with a mortality rate of 57.1%. Of patients with abdominal complications, 20 (40.8%) required surgical procedures and 29 (59.2%) were nonsurgical. Regarding the length of the complication, 33 (67.3%) were early and 16 (32.7%) were late (Table 2).

The main causes of abdominal complications were inflammatory acute abdomen (7 patients; 14%), obstructive acute abdomen (9 patients; 18%), gastroparesis (4 patients; 8%), distal intestinal obstruction syndrome (4 patients; 8%), perforated acute abdomen (7 patients; 14%), cytomegalovirus (CMV; 6 patients; 12%), and other reasons (12 patients; 26%). Separating these patients according to Clavien-Dindo classification (Table 3), we had 21 patients (43%) with grade II complications, 4 patients (8%) with grade IIIa complications, 7 patients (14%) with grade IIIb complications, 7 patients (14%) with grade IV complications, and 10 patients (21%) with grade V complications.

DISCUSSION

GI tract and biliary tract complications are some of the most frequent complications in the post-transplantation period

Table 3. Clavien-Dindo Classification

Grades	Definition
Grade I	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic, or radiological interventions. Allowed therapeutic regimens: drugs as antiemetics, antipyretics, analgetics, diuretics, and electrolytes and physiotherapy. This grade also includes wound infections opened at the bedside.
Grade II	Requiring pharmacological treatment with drugs other than such allowed for grade I complications. Blood transfusions and total parenteral nutrition are also included.
Grade III	Requiring surgical, endoscopic, or radiological intervention.
Grade III-a	Intervention not under general anesthesia.
Grade III-b	Intervention under general anesthesia.
Grade IV	Life-threatening complication (including central nervous system complications)* requiring intermediate care/intensive care unit management.
Grade IV-a	Single-organ dysfunction (including dialysis).
Grade IV-b	Multi-organ dysfunction.
Grade V	Death of a patient.
Suffix "d"	If the patients experiences a complication at the time of discharge, the suffix "d" (for "disability") is added to the respective grade of complication. This label indicates the need for a follow-up to fully evaluate the complication.

*Brain hemorrhage, ischemic stroke, or subarachnoidal bleeding, but excluding transient ischemic attacks.

[8] with incidence of around 7%–48.6%, depending on the definition, the severity of complications, and the follow-up of patients. Moreover, there is evidence that these events cause a significant impact on the quality of life [6] and the survival of those transplant recipients [3,9,10].

Thus, our rate of 17.8% of patients undergoing lung transplantation who had abdominal complications is comparable to the world literature. For instance, some studies only included GI complications requiring surgery [3] and others focused on a particular disease such as cystic fibrosis [11–14]. This disease causes specific GI complications, such as exocrine pancreatic insufficiency, malnutrition, and constipation, which are not necessarily related to the transplantation procedure [11].

Operative interventions may be necessary to solve intra-abdominal complications. Twenty patients (7.2%) with

Table 2. Subgroup Analysis

	Surgical n = 20		P	Nonsurgical n = 29		P
	Yes	No		Yes	No	
Death	13 (65)	7 (35)		14 (48.2)	15 (51.3)	
Median age	57.8 ± 10.2	45.8 ± 17.4	.081	43.5 ± 11.9	40.8 ± 14.3	.621
Postoperative day of complication	23.7 ± 14.6	107.8 ± 47.2	.046	48.3 ± 22.3	69.3 ± 22.9	.715
Time of complication			.031			.316
Early	12 (60)	3 (15)		10 (34.5)	8 (27.5)	
Late	1 (5)	4 (20)		4 (13.8)	7 (24.2)	

Note: Each subgroup was analyzed in relation to death. Results are expressed by number and/or percentage; mean age ± standard deviation.

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