

## ORIGINAL RESEARCH

## Characteristic and histopathological features of patients with perforated peptic ulcer who underwent open surgery therapy at Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

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### ABSTRACT

**Background:** Perforated peptic ulcer is a form of complications from peptic ulcer and one of the most common emergency conditions in medicine. **Objective:** To describe the characteristic and histopathological features of patients with perforated peptic ulcer who underwent open surgery therapy in Dr. Soetomo General Academic Hospital, Surabaya, Indonesia. **Materials and Methods:** This study was a descriptive study by observing patients' data from medical records (secondary data) at Medical Record Center of Dr. Soetomo General Academic Hospital, Surabaya, Indonesia, in 2016. Data obtained were analyzed descriptively. **Results:** Forty-six patients were identified (34 male, 12 female), most of them were between 56-65 years old for male and  $\geq 66$  years old for female. Majority of the subjects had a history of herbal medicine consumption (54%) as risk factors for developing perforated peptic ulcer and the most frequent comorbid diseases were diabetes and hypertension. The histopathological features found mostly were inflammation (100%), necrosis (44%), fibrosis (36%), granulation (17%) and positive *Helicobacter pylori* (6%). **Conclusion:** Majority of the subjects were male, mostly between 56-65 years old for male and  $\geq 66$  years old for female. The histopathological features showed that all subjects had inflammations.

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## BACKGROUND

Peptic ulcer is one of several disorders of the digestive tract. The disorder is in the form of damage to the mucous layer to the muscularis mucosa in the digestive tract by excessive activity of stomach acid. Peptic ulcer can generally occur in the esophagus, stomach and duodenum (Torpy, et al., 2012).

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However, this peptic ulcer is often found in the stomach and duodenum (Mukherjee & Naveen, 2014). Peptic ulcers affect 4 million people worldwide every year (Di Saverio, et al., 2014). Individuals with peptic ulcers generally complain discomfort, pain in their abdomen, and sometimes followed by nausea (Chung & Shelat, 2017).

Peptic ulcer has low mortality rate but the prevalence of morbidity and cost is high. A study found that 35% of patients diagnosed with peptic ulcer may get serious complications. The complications that can occur in people with peptic ulcer are bleeding, perforation, and obstruction (Zinner & Ashley, 2013). The term perforated peptic ulcer was first introduced in England in 1670 by Princess Henrietta (Mustafa, et al., 2015). Perforated peptic ulcer is a life-threatening disease that has a high level of morbidity and mortality based on historical records (Thorsen, 2013). In addition, perforation that occurs in peptic ulcer is still a major surgical problem (Tas, et al., 2015). Some habits can be a risk factor for perforation in peptic ulcers, including smoking, usage of corticosteroids, NSAID's (non-steroidal anti-inflammatory drugs), physical stress, the presence of *Helicobacter pylori*, and a history of peptic ulcer (Chung & Shelat, 2017).

If perforation of the peptic ulcer is present, it must be treated quickly and appropriately. There are several options for dealing with such problem. Therapies that can be provided are non operative management, surgery (including the use of primary repair and sutureless techniques on laparoscopy and resectional surgery), and other techniques that are still in the research stage, the SEMS (Self-expandable metal stens), and NOTES (Natural transluminal endoscopic surgery orifice) (Di Saverio, et al., 2014). In Dr. Soetomo General Academic Hospital, Surabaya, Indonesia, especially in Surgical Inpatient Installation, there were many patients with perforated peptic ulcer, mainly those who received open surgery therapy.

## OBJECTIVE

This study was intended to describe the characteristic and histopathological features of patients with perforated peptic ulcer who underwent open surgery at Dr. Soetomo General Academic Hospital, Surabaya, Indonesia.

## MATERIALS AND METHODS

This was a descriptive observational study using secondary data from medical records of the patients with perforated peptic ulcer who underwent open surgery therapy at Dr. Soetomo General Academic Hospital, Surabaya, Indonesia, in 2016. We observed the data regarding sex, age, risk factors, comorbid disease, and histopathology examination results of those patients. The population in this study were all patients with perforated peptic ulcer who underwent open surgery therapy at the Surgical Inpatient Installation of Dr. Soetomo General Academic Hospital. This study used total sampling method involving those who met the inclusion and exclusion criteria.

Criteria for inclusion in this study were all patient whose medical record had information about sex, age, risk factors, comorbid disease, dan histopathology examination. The exclusion criteria in this study were all patients with incomplete information in the medical record. Data were analyzed descriptively and presented in frequency distribution tables. Tables were elaborated descriptively.

## RESULTS

Total number of samples in this study were 46 patients with perforated peptic ulcer who underwent open surgery therapy at Surgical Inpatient Installation of Dr. Soetomo General Academic Hospital, Surabaya, Indonesia, in 2016. Characteristics analyzed in this study were sex, age, risk factors, comorbid disease, and histopathological features who met the inclusion and exclusion criteria (Tables 1 – 5).

Table 1. Sex characteristic of subjects

Sex	Frequency	%
Male	34	73.9
Female	12	26.1

Table 2. Age characteristic of the subjects

	Age	Frequency	%
Male	17-25	1	3
	26-35	0	0
	36-45	2	6
	46-55	7	21
	56-65	13	38
	≥ 66	11	32
Female	46-55	3	25
	56-65	4	33
	≥ 66	5	42

Table 3. Risk factors characteristic of the subjects

Risk Factors	Frequency	%
NSAID	12	26%
Herbal medicine	25	54%
Cigarettes	8	17%
Alcohol	1	2%

Table 4. Comorbidities of the subjects

Comorbidities	Frequency	%
AKI	1	2.2%
Left renal stone	1	2.2%
Cystic fibrosis calculi	1	2.2%
Diabetes	6	13.0%
Gastritis	2	4.3%
Geriatric	1	2.2%
Left hernia	1	2.2%
Lateral inguinal hernia	1	2.2%
Hepatitis B	1	2.2%
Hypertension	6	13.0%
HIV	1	2.2%
Conjunctivitis	1	2.2%
Melena	1	2.2%
Heart disease	1	2.2%
Coronary heart disease	1	2.2%
Pneumonia	1	2.2%
Active pulmonary TB	1	2.2%
None	20	43.5%
No information	3	6.5%

Table 5. Histopathological features

Histopathological features	Present		Absent	
	n	%	n	%
Necrosis	16	44	20	56
Inflammation	36	100	0	0
Granulation	6	17	36	83
Fibrosis	13	36	23	64
<i>Helicobacter pylori</i>	2	6	34	94

Majority of the subjects in this study were male (73.9%), while female patients were 21.6%. The most frequent age group with perforated peptic ulcer who underwent open surgery therapy in male patients was 55-65 years old, while in female patients was ≥66 years old. The most frequent risk factors were herbal medicine consumption (54%), followed by NSAID usage (26%), cigarette (17%), and alcohol (2%). The most frequent comorbid diseases were diabetes and hypertension, while there were 43.5% patients who did not have comorbidities.

Based on histopathology examination result, the histopathological features found mostly was inflammation (100%), followed by necrosis (44%), fibrosis (36%), and granulation (17%), while specimens that had positive *Helicobacter pylori* were 6%.

## DISCUSSION

### Characteristics of the subjects

Majority of subjects in this study were male (73.9%), while female were 12 subjects (26.1%). This result similar with previous research in Poland which showed that there were 66.7% male and 33.3% female patients with perforated gaster, while 77.6% male and 22.4% female patients with perforated duodenum (Wysocki, et al., 2011). Another study by Dongo et al showed that comparison of male and female with perforated peptic ulcer was 3.5 : 1 (Dongo, et al., 2017), while the other study in India found similar result that the comparison of male and female with perforated peptic ulcer was 4:1 (Shah & Panchal, 2016).

The most frequent age group with perforated peptic ulcer who underwent open surgical therapy was 55-65 years old in male and  $\geq 66$  years old in female. It was in accordance with a study in India which found that perforated peptic ulcer peak incidence occurred in those of more than 50 years old (Deshmukh, et al., 2016). A study by Bansod et al. found that there were 70 patients (40%) with perforated peptic ulcer between 18-30 years old (Bansod, et al., 2014), while in this study there were 3% patients (male group) aged 17-25 years old with perforated peptic ulcer. Predisposing factors for the occurrence of perforated peptic ulcer in younger age group are often associated with alcohol consumption and smoking (Bansod, et al., 2014).

Majority of subjects in this study had a history of consuming herbal medicine (54%), followed by NSAID usage (26%), cigarette (17%), and alcohol (2%). A study by Yang et al. found different results, in which there were history of cigarette smoking (55.8%), alcohol consumption (47.2%), NSAID usage (11.2%), and steroid usage (2%) (Yang, et al., 2017). In this study, there were 43.5% patients who did not have comorbidities, while the most frequent comorbid disease were diabetes and hypertension (13.0% for each). A study in Korea by Yang et al. showed that comorbid disease in patients with perforated peptic ulcer were cardiovascular disease, diabetes, chronic liver disease, cerebrovascular disease, malignancy, chronic renal damage, and infectious disease (Yang, et al., 2017).

### Histopathological features

Histopathology examination found that all subjects had inflammation (100%), followed by necrosis (44%), fibrosis (36%), granulation (17%), and specimen that had positive *Helicobacter pylori* were 6%. This result was similar to that in the previous study in Medan, Indonesia which showed that there was 100% chronic inflammation in histopathology examination (Koto & Asrul, 2016). This result was different from previous research in Departement of General Surgery, Himalayan Institute of Medical Science, Swamni Ram Nagar, Dehradun, which found that 61% patients with perforated peptic ulcer had positive *Helicobacter pylori* (Rehmani & Pathak, 2018). Different result was also found in John et al.'s research which showed that 46.9% of patients with perforated peptic ulcer had positive *Helicobacter pylori* (John, et al., 2017).<sup>17</sup> These histopathological features depend mainly on the location of specimens taken, sent and processed at the Anatomic Pathology Installation.

### CONCLUSION

Most of the patients with perforated peptic ulcer who underwent open surgery therapy at Dr. Soetomo General Academic Hospital, Surabaya, Indonesia, were male, commonly from the age group of 55-65 years old, while most of the female patients were  $\geq 66$  years old. The most frequent risk factors were herbal medicine consumption, while the most frequent comorbid diseases were diabetes and hypertension. Histopathological features showed that all subjects had inflammation, while only several subjects showed necrosis, fibrosis, granulation, and positive *Helicobacter pylori*.

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