

## Gastric cancer in pregnancy: is laparoscopic gastrectomy with lymph node dissection feasible and safe?

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Gastric cancer with pregnancy is rare and usually presents in late and advanced stage. Standard interventions in diagnosing, staging and treatment of cancer may be harmful for the fetus. The treatment of cancer in pregnancy should not differ significantly from the treatment in nonpregnant women. There have been case reports of open gastrectomy for gastric cancer in pregnancy. We present a case of early gastric cancer in a 37-year-old pregnant woman treated with laparoscopic distal gastrectomy with lymph node dissection with no postoperative complications. Laparoscopic distal gastrectomy with lymph node dissection seems to be feasible and safe in pregnancy for a mother and a fetus.

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**Key Words:** Stomach neoplasms, Pregnancy, Laparoscopy

### INTRODUCTION

Cancer in pregnancy is rare with an incidence of 0.1%. In Japan, the rate of gastric cancer during pregnancy is 0.016% [1]. In South Korea, only 15 patients (0.103%) were pregnant out of 14,536 gastric cancer patients admitted to Seoul National University Hospital [2]. Symptoms overlap between gastric cancer and pregnancy, which leads to late diagnosis with advance stage. About 90% of gastric cancer cases in pregnancy are diagnosed in advance stage with about 50%–80% unresectable cases [2]. The management of cancer during pregnancy needs multidisciplinary teams, including a surgeon, an obstetrician, a neonatologist, and an oncologist, etc. Among all the reported cases and reviews, the management of gastrectomy was done through open method regardless of gestational week and stage of disease. There was no patient who underwent laparoscopic gastrectomy, although there is no clear contraindication for laparoscopic surgery during pregnancy. We present here our experience of laparoscopic distal gastrectomy

for early gastric cancer in a pregnant woman in her 17th week of gestation, with a follow-up 4 months postdelivery.

### CASE REPORT

A 37-year-old female presented with persistent loss of appetite, postprandial abdominal pain and amenorrhea for 12 weeks. Gastroscopy was done and showed early gastric cancer at the angle of stomach. The pregnancy test was positive. Abdomen MRI showed no lymph node metastasis with cT1N0M0 (Fig. 1). After consultation of an obstetrician, the decision was to proceed with surgery without termination of pregnancy. All the risks and benefits were explained to the patient and her family. The patient underwent total laparoscopic distal gastrectomy with uncut Roux en Y gastrojejunostomy with D1+ lymph node dissection at the 17th week of gestation. D1+ lymph node dissection included the dissection of station 1, 3, 4sb, 4d, 5, 6, 7, 8a, and 9 according to Japanese guidelines [3]. The first port was inserted infraumbilically with open Hasson technique. The

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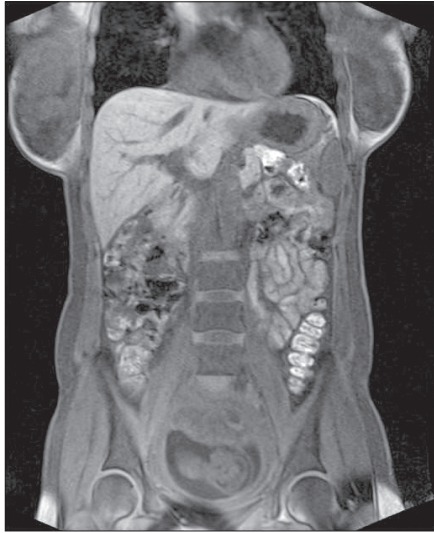
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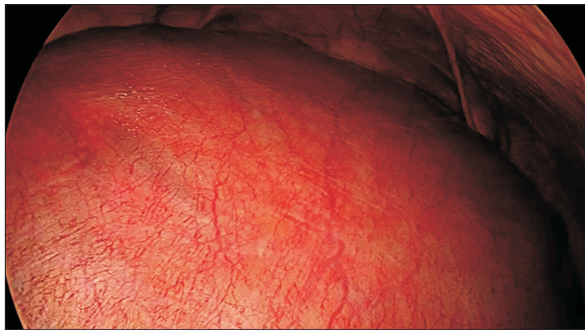
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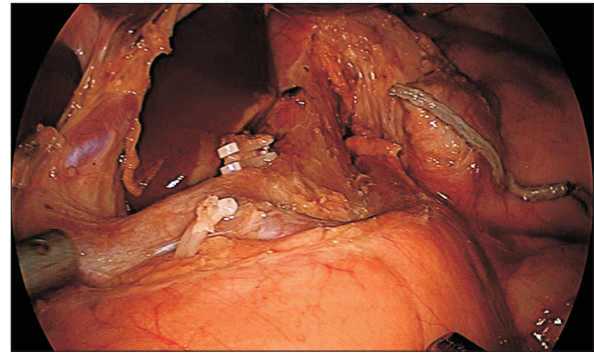


**Fig. 1.** MRI abdomen: no lymph node or distant metastasis. A fetus in the uterus can be seen.



**Fig. 2.** Laparoscopic view of the pregnant uterus.

other 4 ports were inserted under vision at a higher position. The abdominal pressure was set at 10 mmHg. The abdomen view was good at a free range of instrument movement. The pregnant uterus could be seen (Figs. 2, 3). The intraoperative and postoperative course showed no immediate complications to the patients and her fetus. The operation time was 135 minutes. The patient was discharged on postoperative day 6 with her healthy fetus. The final histopathology report presented stage 1a [pT1aN0 (0/40) M0] (American Joint Committee on Cancer 7th edition) with tubular adenocarcinoma, poorly differentiated with the signet ring cell component. At the 39th week of gestation, the patient had a normal spontaneous vaginal delivery with a 3.0-kg healthy baby. The patient visited the outpatient clinic 4 months after delivery in good condition. In pediatric clinic follow-up, abdominal ultrasound for the baby showed left kidney duplication with hydronephroureter with probable ectopic ureteral insertion. Renal scan showed partial obstruction of the left kidney, upper moiety with moderate decrease in function. Voiding cystourethrogram of the baby was normal.



**Fig. 3.** The abdominal view after D1+ lymph node dissection.

## DISCUSSION

Gastric cancer in pregnancy can be defined as diagnosis of gastric cancer during pregnancy or within 1-year postdelivery [2]. Most patients were found to have advanced cancer at presentation. In pregnancy, the stomach biology changes as the *Helicobacter pylori* infection rate is higher for pregnant women, the acid secretion in the stomach decreases and mucus production increases [4]. Some authors suggest that pregnancy and delivery may cause rapid growth and spread of cancer [1]. In addition, delay in diagnosis because of overlapping symptoms with pregnancy, can explain why most patients present in advanced stages. The clinical features of gastric cancer in pregnant and nonpregnant young women are the same [5]. Although, the prognosis in pregnant women is worse mainly due to late and advanced presentation.

The management of pregnancy including termination of delivery either by cesarean section or vaginal delivery depends on gestational week and stage of disease with no clear treatment guidelines. There are no data to suggest that pregnancy termination alters the biological behavior of the tumor or patient prognosis in the presence of appropriate antineoplastic therapy [6].

Surgery and chemotherapy are known as generally safe in pregnancy [7]. Surgery is safe in all trimesters [6]. For any surgical intervention, there are 4 important factors that should be taken into consideration: optimal surgical outcome, maternal safety, fetal safety, and prevention of miscarriage or preterm labor. Prematurity is the most common pregnancy complication [7]. Prenatal exposure to maternal cancer with or without treatment did not impair the cognitive, cardiac, or general development of children in early childhood. Prematurity was correlated with a worse cognitive outcome, but this effect was independent of cancer treatment [8].

Laparoscopy becomes technically difficult after 26–28 weeks of gestational age due to the gravid uterus, and laparotomy is preferred. Experts participating in a consensus meeting on gynecologic malignancies during pregnancy recommend

four conditions for laparoscopy during pregnancy: a maximal laparoscopic procedure time of 90 minutes, a pneumoperitoneum with a maximal intra-abdominal pressure of 10–13 mmHg, open introduction, and an experienced surgeon [9]. Laparoscopic surgery in advanced pregnancy was found to be feasible and safe as in early pregnancy, without any adverse effects on pregnancy outcome [10].

Nowadays, laparoscopic gastrectomy is popular for treatment of early gastric cancer. In pregnancy, there should be no difference in treatment of gastric cancer in nonpregnant patients, especially in early gastric cancer in the matter of laparoscopy and continuation of pregnancy. In our case, laparoscopic gastrectomy with lymph node dissection was feasible regardless of the relatively long operation time of over 90 minutes. The

only minor technical difficulty was the limitation of camera movement toward the lower abdomen in avoiding contact with the pregnant uterus.

In conclusion, we recommend that laparoscopic gastrectomy by an experienced surgeon may be taken into consideration in the treatment of early gastric cancer in pregnancy, especially in the 2nd trimester of pregnancy, and seems to be feasible and safe for a mother and a fetus.

## CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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