



**Mount
Sinai
Morningside**

Gastric Ultrasound in Parturients Presenting for Scheduled Cesarean Delivery

Michael Balot, D.O., Ghislaine Echevarria, M.D., M.S., Mickael Khouzami, M.D., Bryan Mahoney, M.D., Thomas Gruffi, M.D.

Department of Anesthesiology at Mount Sinai Morningside & West Hospitals



**Mount
Sinai
West**

INTRODUCTION

Pregnant patients have an increased risk of aspiration, largely due to progesterone induced slowing of gastric motility and the compressive effects of the uterus causing incompetency of the gastroesophageal sphincter. Term parturients are considered to be full stomach, which has led to the routine practice of administering a liquid antacid to prophylactically prevent aspiration pneumonia. However, the use of oral antacids can lead to adverse side effects, which include nausea, emesis, abdominal pain, and diarrhea. Gastric point-of-care ultrasound (G-PoCUS) is a useful technique to assess gastric volume in pregnant patients presenting for surgery.^{1,2} We are presenting the G-PoCUS quantitative data of all scheduled cesarean deliveries performed during January-2022.

METHODS

This study was exempt from the Icahn School of Medicine at Mount Sinai IRB approval. All G-PoCUS data of patients scheduled for an elective cesarean section who had followed standard ASA NPO guidelines were reviewed (n=21). Measurements of the gastric antral cross-sectional area (CSA) were performed using a low frequency curved-array transducer in the semi-recumbent and right lateral semi-recumbent (RLSR) position. Two models were used to calculate the gastric volume.^{3,4}

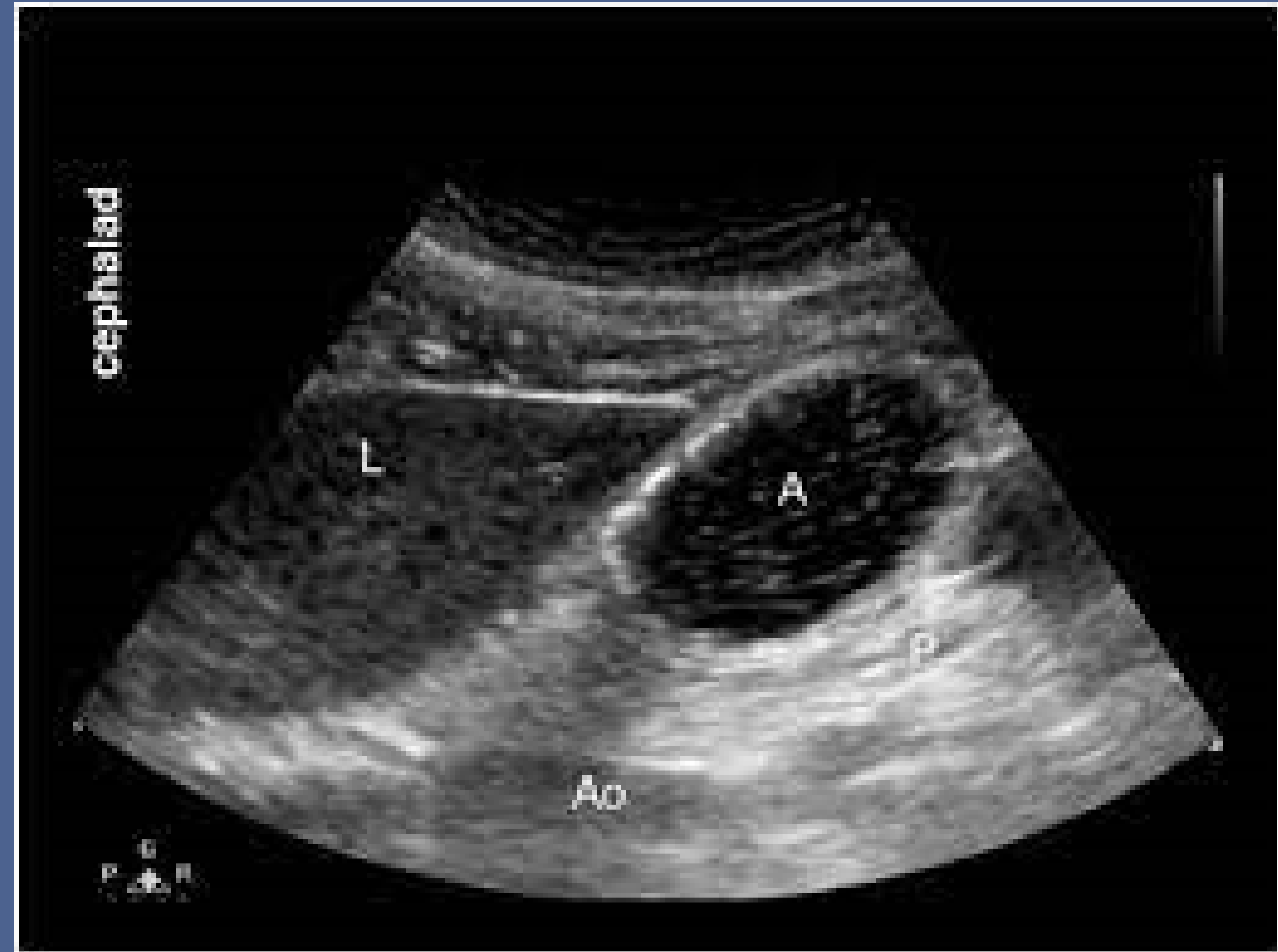


Figure 1. Gastric Ultrasound Image

<http://www.usra.ca/regional-anesthesia/specific-blocks/pocus/gastric.php>



Mount
Sinai
Morningside

Gastric Ultrasound in Parturients Presenting for Scheduled Cesarean Delivery

Michael Balot, D.O., Ghislaine Echevarria, M.D., M.S., Mickael Khouzami, M.D., Bryan Mahoney, M.D., Thomas Gruffi, M.D.

Department of Anesthesiology at Mount Sinai Morningside & West Hospitals



Mount
Sinai
West

RESULTS

21 patients scheduled for elective cesarean delivery received ultrasound assessment of gastric volume. Using a cutoff of 9.6 cm² for antrum CSA measured in the RLSR position described by Arzola et al,³ 1 patient (4.8%) was considered to have an increased gastric fluid volume. Based on the Roukhomovsky et al model,⁴ 15 (71.4%) and 3 (14.3%) patients had a quantitative gastric volume of < 0.8 (“empty” or low volume stomach) and ≥1.5 mL/kg (increased gastric fluid volume), respectively.

	Scheduled Cesarean deliveries (n=21)
Age (years)	35 (32 - 38)
BMI (kg/m ²)	32.3 (28.1 - 36.2)
Gestational Age (weeks)	37.7 (37.1 - 39.1)
Gestational Diabetes, n(%)	6 (28.6)
Birth Weight (g)	3430 (2863 - 3800)

Table 1.
Median (IQR), unless stated otherwise.

Table 1. Patient Demographic Data

Total number of patients:	21
Median area (Arzola method)	4.32 cm ² (IQR 2.63 - 4.77)
Median Area (Roukhomovsky method)	0.55 ml/kg (IQR 0.12 - 0.86)
Cases with ≥1.5 ml/kg	1.58 ml/kg (BMI 32.2, 37 + 1 wks)
	2.14 ml/kg (BMI 35.3, 37 + 4 wks)
	1.94 ml/kg (BMI 27.4, 39 wks)

Table 1. Gastric Ultrasound Measurement Values



Mount
Sinai
Morningside

Gastric Ultrasound in Parturients Presenting for Scheduled Cesarean Delivery

Michael Balot, D.O., Ghislaine Echevarria, M.D., M.S., Mickael Khouzami, M.D., Bryan Mahoney, M.D., Thomas Gruffi, M.D.

Department of Anesthesiology at Mount Sinai Morningside & West Hospitals



Mount
Sinai
West

CONCLUSIONS

In our experience, G-PoCUS is a useful and feasible tool to assess the risk of aspiration in this population. Data suggest that gastric volumes up to 1.5 mL/kg are considered normal in fasted patients.⁵ Moreover, in pregnant patients in their third trimester, a value above 9.6 cm² for the antral CSA in the RLSR position correlates with ingested volumes greater than 1.5 mL/kg with a sensitivity of 80% and specificity of 66.7%.³

Many of our patients endorse side effects with the administration of sodium citrate/citric acid and state that it had a negative impact on their delivery experience. These findings lead us to question whether universal administration is necessary.

REFERENCES

1. Neumann KE, et al. Anesthesiol Clin. 2021 Dec;39(4):811-837.
2. Howle R, et al. Int J Obstet Anesth. 2020 Nov;44:24-32.
3. Arzola C, et al. Anaesthesia. 2018 Mar;73(3):295-303.
4. Roukhomovsky M, et al. Eur J Anaesthesiol. 2018 May;35(5):379-389.
5. Van de Putte P, Perlas A. Anaesthesia 2018; 73:295–303.

