



Risk Factors for Complication After Second Trimester Dilation & Evacuation

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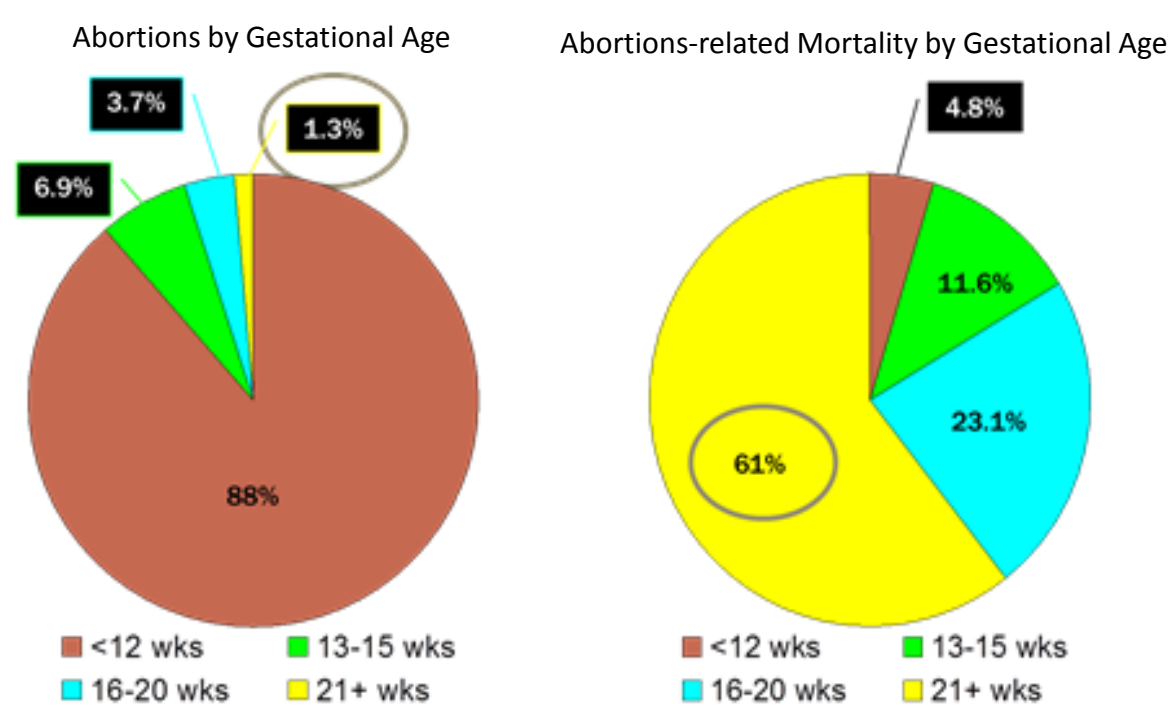
PATHWAYS
TO DISCOVERY

BACKGROUND

- 140,000 second-trimester abortions occur each year in the US [1].



- Complications are rare, ranging from 0.6% to 7% in the second trimester, and are more likely with increasing gestational duration (GD) and history of cesarean section [2-4].



- 36% of the U.S. obstetric population is obese [5].
- Many abortion centers limit care to non-obese women, which leads to delayed care and therefore increased risk of complications for obese women [8].
- The relationship of obesity with complications of second trimester abortion, and the magnitude of the association remain unclear [6,7].

SPECIFIC AIMS

- To determine the association between obesity and complications after second trimester dilation & evacuation (D&E).
- To identify other risk factors associated with complication after D&E.

METHODS

- Design:** Retrospective cohort study
- Subjects:** All women who underwent D&E between February 2009 and April 2013 at San Francisco General Hospital (SFGH) Women's Options Center (WOC).
- Data Collection & Outcome ascertainment:** An existing prospectively collected database of all abortions performed at the SFGH WOC was used (see flow chart).

Study Definitions:

- Cervical laceration – laceration requiring suture repair
- Hemorrhage – estimated blood loss (EBL) ≥500mL
- Hemorrhage by clinical criteria – bleeding requiring intervention including 3+ doses of uterotonics.
- Uterine atony – atony identified by the attending physician and requiring intervention
- Retained products of conception (POC) – need for repeat procedure
- Uterine perforation – creation of a false passage through the myometrium
- Disseminated intravascular coagulation (DIC)

Statistical Analysis:

- Unadjusted analysis: compared proportions using χ^2 and means using t-tests
- Adjusted model: Planned a priori to include BMI, age, gestational duration (GD), and prior cesarean delivery. Models were built using stepwise forward selection with $p \leq 0.05$ criteria for inclusion.

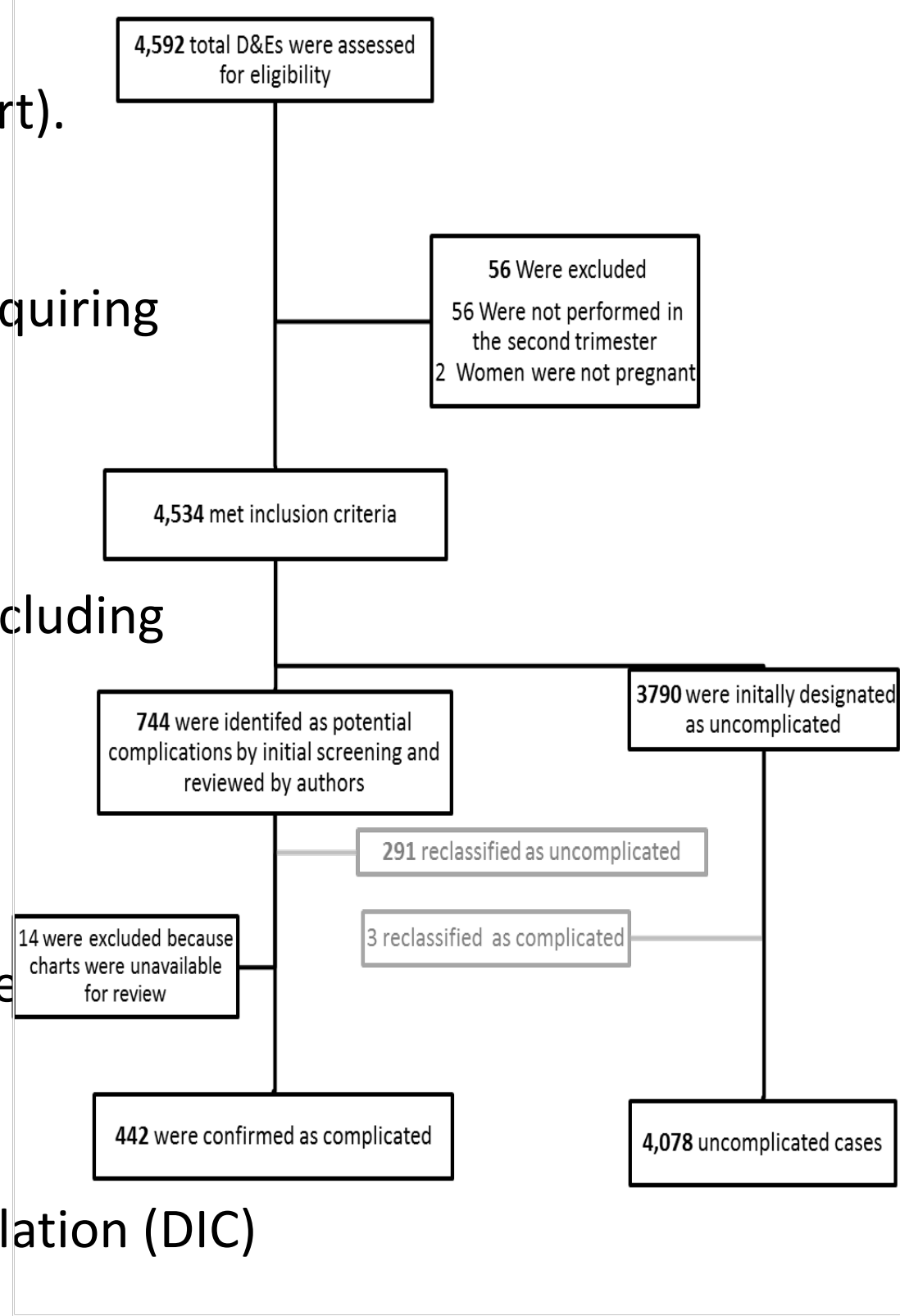


Table 1. Characteristics of Women Undergoing D&E

Characteristic	N (%) ^a
Total	4,520
Age (years)^b	26.6 (6.8)
Ethnicity	
African American	1,288 (28.5)
White	1,250 (27.6)
Hispanic or Latino	1,212 (26.8)
Asian	448 (9.9)
Pacific Islander or Native Hawaiian	85 (1.9)
Native American or Eskimo	45 (1.0)
Other or unknown	108 (4.3)
Payment type	
MEDI-CAL	3787 (83.9)
Private insurance	348 (7.7)
Self-pay	282 (6.2)
MEDICARE	72 (1.6)
Other public insurance	27 (0.6)
Unknown	4 (0.09)
Prior vaginal deliveries	
None	2,202 (48.7)
1	1,105 (24.5)
2	647 (14.3)
3+	563 (12.5)
Prior cesarean deliveries	
None	3,542 (78.4)
1	598 (13.2)
2	275 (6.1)
3+	105 (2.3)
Prior abortion	
No	2,113 (46.7)
Yes	2,400 (53.1)
Gestational duration^b	19.8 (2.8)
Gestational duration categories	
14 ⁰ to 15 ⁶	573 (12.7)
16 ⁰ to 17 ⁶	612 (13.5)
18 ⁰ to 19 ⁶	952 (21.1)
20 ⁰ to 21 ⁶	1,149 (25.4)
22 ⁰ to 24 ⁰	1,234 (27.3)
Body Mass Index (BMI) (kg/m²)^b	27.6 (6.7)
BMI (dichotomous)	
BMI < 30	3,159 (69.9)
BMI ≥ 30	1,234 (27.3)
BMI WHO Categories	
Underweight	96 (2.1)
Normal weight	1,789 (39.6)
BMI ≥25 and < 30	1,274 (28.2)
BMI ≥30 and < 35	639 (14.1)
BMI ≥35 and < 40	328 (7.3)
BMI ≥ 40	267 (5.9)
Additional cervical dilation during procedure	
No	3,857 (85.3)
Yes	663 (14.7)
Primary proceduralist	
Attending	1,781 (39.4)
Family planning fellow	955 (21.1)
Resident, PGY3	1,781 (39.4)
Procedure duration, minutes^b	13.2 (7.5)

a. Not all categories add to total due to missing values

b. Mean (SD), not N (%)

RESULTS

Table 2. Complication and Intervention Rates

Complication	N (%)
All complications	442 (9.8)
Major complication ^a	78 (1.7)
Individual complications ^b	
Cervical laceration	173 (3.8)
Atony	137 (3.0)
Hemorrhage by clinical criteria	299 (6.6)
Hemorrhage by EBL (≥500cc)	105 (2.3)
Retained products of conception (RPOC)	10 (0.2)
Uterine perforation	3 (0.1)
Disseminated intravascular coagulation	10 (0.2)
Other ^c	12 (0.3)
Intervention	N (%)
Administration of ≥3 uterotonic medications	278 (6.2)
Reaspiration ^b	125 (2.8)
Within initial procedure time	46 (1.0)
Returned to procedure room	79 (1.8)
For Bleeding	114 (2.5)
For Retained products of conception (RPOC)	10 (0.2)
For Pain	4 (0.1)
Intrauterine balloon	119 (2.6)
Hospitalization	73 (1.6)
Transfusion	38 (0.8)
Uterine artery embolization	22 (0.5)
Laparoscopy or laparotomy	5 (0.1)
Hysterectomy	2 (0.04)

a. Major complications are those requiring admission, transfusion or major surgery.

b. Categories not mutually exclusive

c. 6 cases of post-abortion endometritis, 2 cases of labial laceration requiring repair, 1 case of unintentional induction of labor with dilator placement requiring urgent D&E, 1 case of dilator misplacement requiring replacement, 1 case of post-operative pain requiring reaspiration, and 1 case of a post-operative infarcted fibroid requiring myomectomy.

Figure 1. Complication type as a percent of all complications

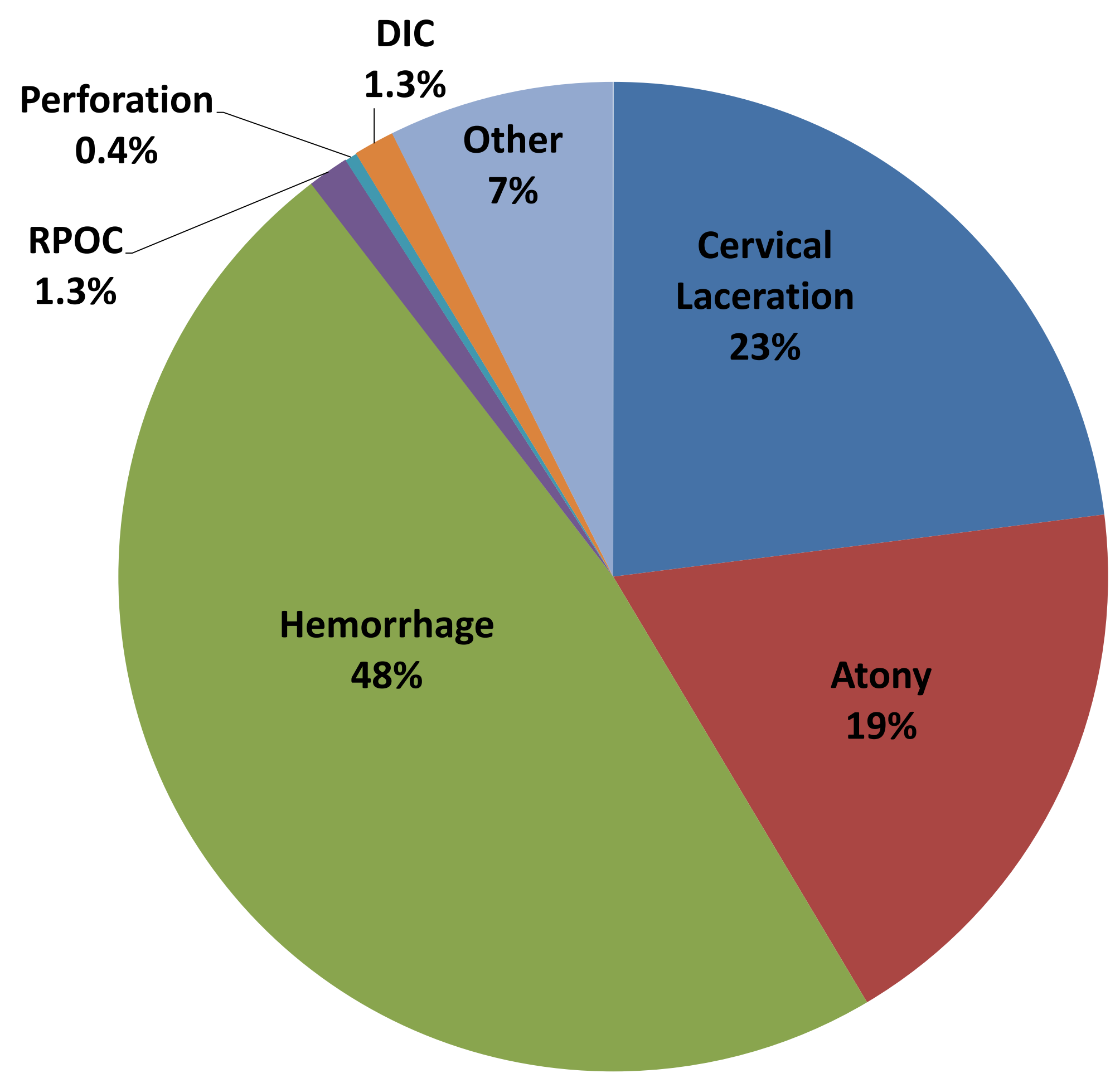


Table 3. Adjusted odds of any complication after D&E

Predictor Variable	Odds Ratio (95% CI)	p-value
Age (per 10 years)	1.04 (0.87, 1.23)	0.7
Non-White Ethnicity	1.22 (0.96, 1.54)	0.11
Additional week of gestation	1.33 (1.27, 1.40)	<.0001*
Body Mass Index (kg/m2)		
Normal Weight	Reference	
Underweight	1.24 (0.57, 2.7)	0.59
BMI ≥25 and < 30	0.93 (0.72, 1.20)	0.59
BMI ≥30 and < 35	1.02 (0.74, 1.40)	0.91
BMI ≥35 and < 40	0.73 (0.47, 1.15)	0.18
BMI ≥40	1.22 (0.77, 1.95)	0.4
Prior cesarean deliveries	1.77 (1.36, 2.3)	<.0001*
Prior vaginal deliveries	1.49 (1.18, 1.88)	0.0008*

Figure 2. BMI is similarly distributed in procedures with and without complications

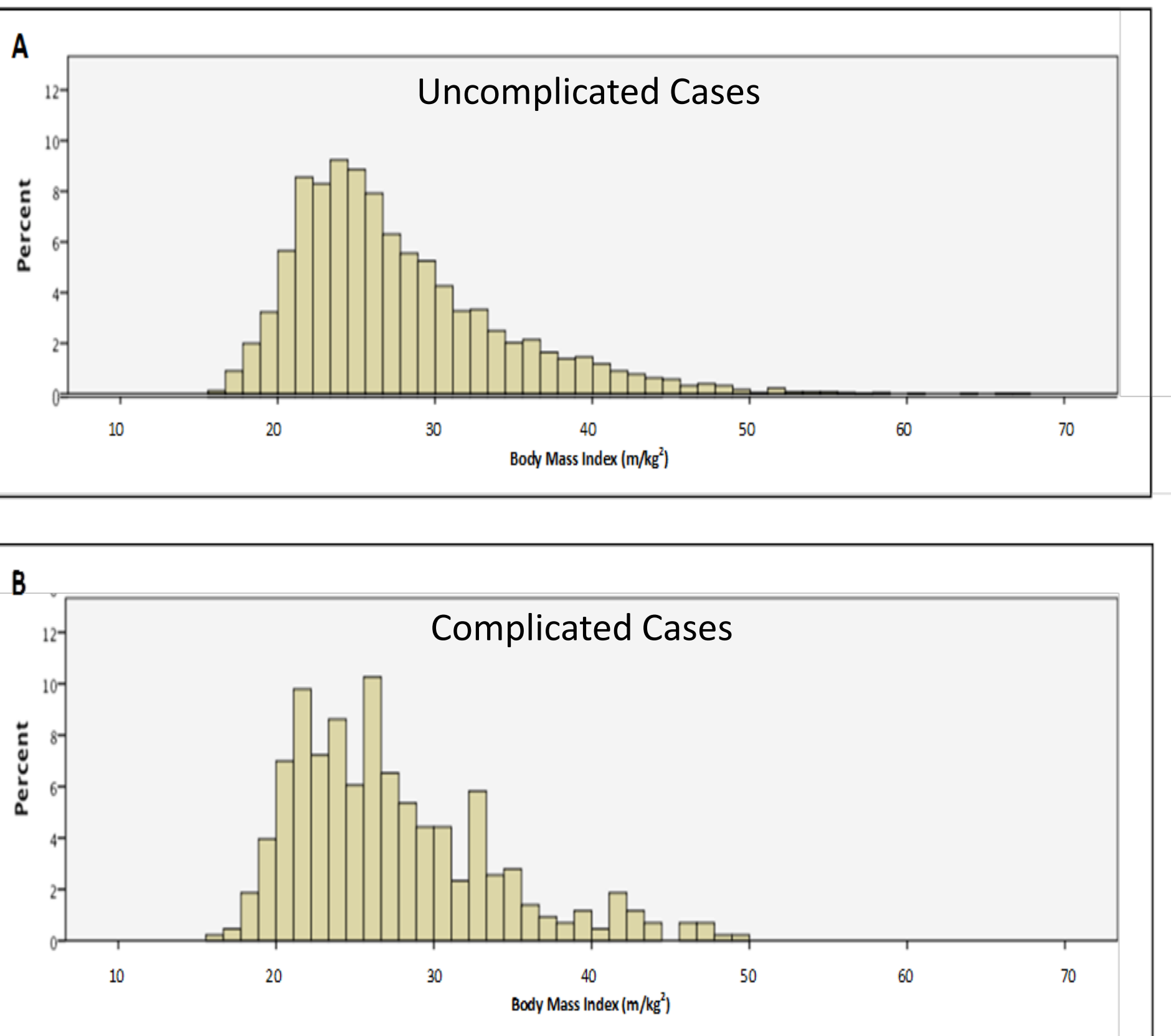
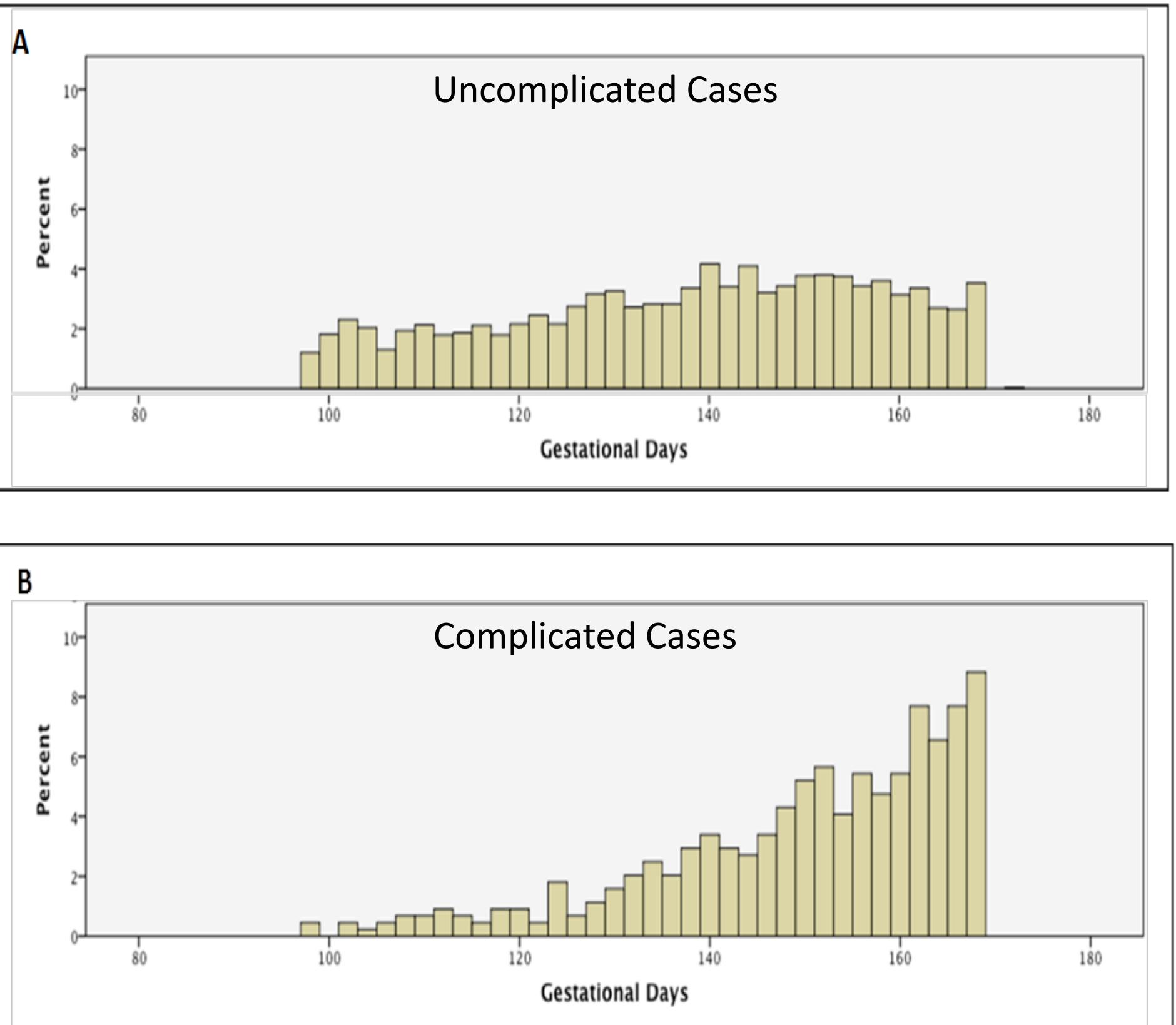


Figure 3. Gestational age distribution among complicated procedures is skewed towards more advanced gestational age.



CONCLUSIONS

- Major complications of D&E are rare (<2%),** even at a high risk center.
- Hemorrhage accounted for nearly half of all complications in our study.** Our definition of hemorrhage was more inclusive than other studies. This likely accounts for the higher proportion of overall complications we observed.
- BMI appears to contribute minimally to risk of complications after D&E;** therefore obesity may not warrant referral to higher acuity providers.
- Prior cesarean delivery is the strongest independent predictor of complication (OR 1.8).** Prior vaginal delivery (OR 1.5) is also an independent predictor.
- Each additional week of gestation is an independent predictor of complications (OR 1.3).**

Our findings suggest that no level of BMI warrants referral to a tertiary abortion center. In fact, the delay associated with referral may increase risk for complications.

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