

Trial of Labor After C-Section (TOLACs) at Northwestern Medicine Central DuPage Hospital

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Introduction

Successful vaginal delivery after a C-Section (VBAC) has shown to have lowest morbidity rates for expecting mothers with a history of C-Section as shown in **Figure 1**. However, a failed trial of labor after a C-Section (TOLAC) has a higher risk of maternal morbidity than a scheduled repeat C-Section, as shown in **Figure 1**. A failed TOLAC leads to a higher risk of uterine scar dehiscence and higher chance of uterine rupture during labor. The differences between morbidity creates a need for physicians to accurately assess which patients would be good candidates for a TOLAC and which patients would be better candidates for an elective repeat C-Section. Another motivation to identify good candidates for TOLAC is to avoid multiple surgeries on patients.

Patients with three or more C-Sections have a higher risk of complications, such as hemorrhage, bladder or bowel incontinence, or placenta accreta disorders. Successful VBACs open the door for other possible VBACs in the future. This study aimed to look at TOLACs within the Northwestern Medicine Central DuPage Hospital (NMCDH) system to assess the quality of care at NMCDH compared to the national averages and to assess if any specific variables were better at predicting successful VBACs.

Aims

Goals of Project:

- Assess quality of TOLAC care at NM CDH for a hospital wide Quality Improvement project

Proposed Questions:

- What percentage of all CDH deliveries are TOLACs?
- How many TOLACs do we induce vs. how many come in in Spontaneous Labor?
- What percentage of our TOLACs end up with Uterine Rupture? What about Uterine Scar Dehiscence?
- What percentage of our TOLACs successfully VBAC?
- Does the VBAC success score make a difference in predicting successful VBAC?
- Does time in labor affect success of VBAC?

Location of Project:

Northwestern Medicine Central DuPage Hospital (Labor and Delivery)
(25 Winfield Rd, Winfield, IL 60190)

Methods

Patient Criteria:

Patients studied were those who delivered at NMCDH between 4/1/2022 and 3/31/2023. There were 2703 deliveries. Of these, Epic parameters were used to remove patients with primary C-Sections and first pregnancies because by definition they could not be TOLACs. There were 1699 patients in this group. After this, each of the 1699 charts were opened and reviewed to establish whether or not the patient was a TOLAC (manual chart review). There were 114 patients who fit this criteria. The following data was then collected on these patients.

Data Collection:

After narrowing down and isolating the TOLAC patients, charts were studied to document the following factors: Bishop Score, VBAC Success Score, BMI Pre-Gravida (if unavailable then estimated pre gravida weight or gravida weight), Maternal Age, Uterine Rupture, Uterine Scar Dehiscence, and Additional Comments/Complications.

Successful
VBAC (2.4%)

Elective C-
Section (3.6%)

Failed TOLAC (14.1%)

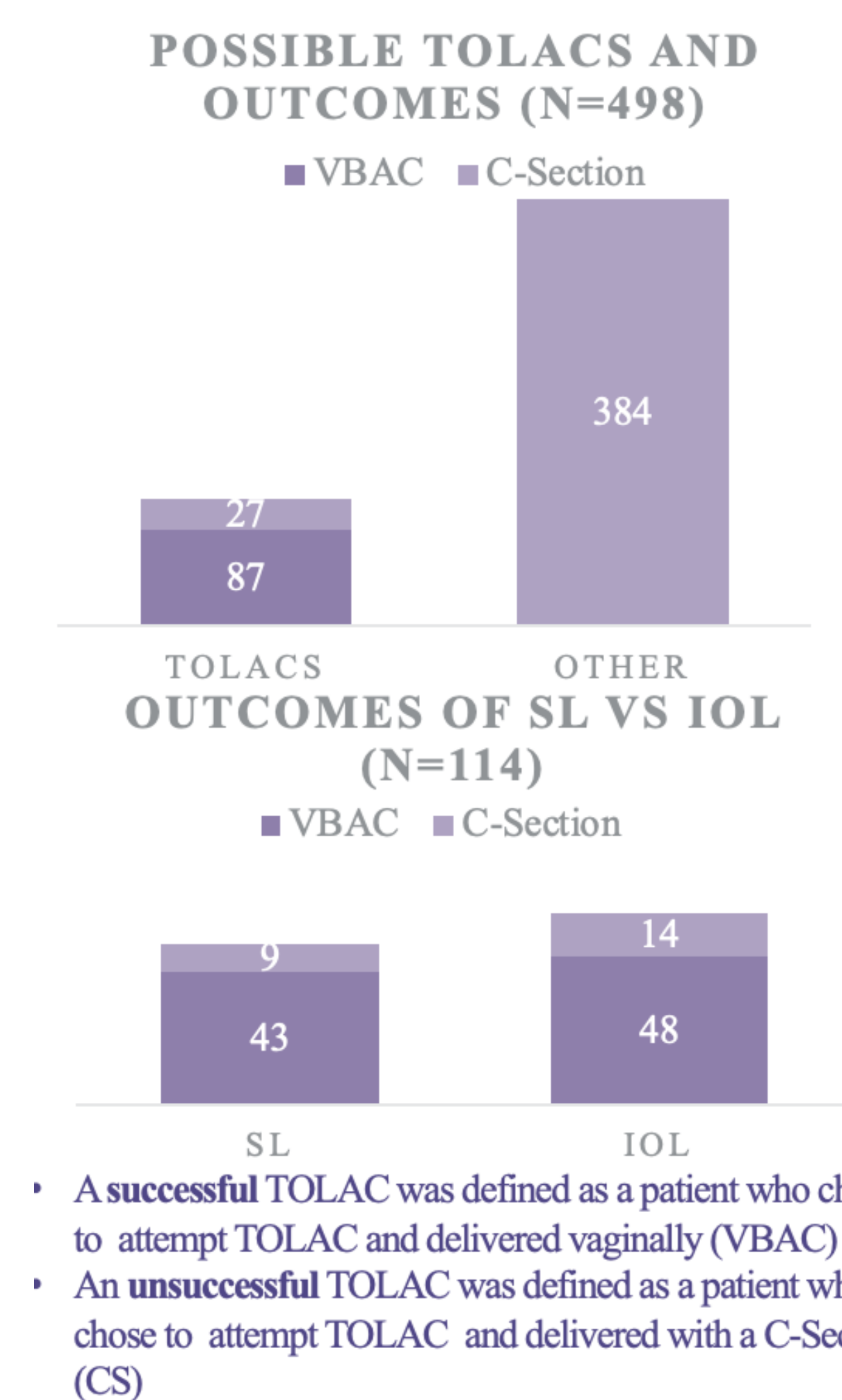
Figure 1 highlights the maternal morbidity rates for patients with a history of C-Section. A failed TOLAC has a higher morbidity rate than an elective C-Section, but a successful VBAC has a lower rate of morbidity than a scheduled repeat C-Section.

Risks of TOLAC

Induction of Labor	During Labor	Post Partum
- Cook Balloon may not stay because of cervix condition - Cytotec (drug used to induce labor) cannot be used if there is a history of previous uterine incision because it has been correlated with increased uterine rupture	- Uterine Rupture - Uterine Scar Dehiscence - Increased Blood Loss	- Increased Bleeding (hemorrhaging) - NICU Admission - Mother ICU Admission - Higher Length of Stays - Trauma
Lower Risks of TOLAC		Higher Risk of TOLAC
- Only 1 prior C-Section - Previous Vaginal Delivery - Uncomplicated Pregnancy - Myometrial thickness is greater than 2.8 mm - Low transverse C-Section (LTCS) - Low vertical C-Section (LVCS) - BMI is normal - Spontaneous Labor - Reason for previous C-Section is non-reoccurring (ie: Breech, fetal intolerance to labor, unstable lie)		- Twins - Multiple prior C-Sections - Pregnancy complicated with chronic hypertension - Myometrial thickness is less than 2.8 mm - Placenta is attached abnormally in uterus (previa or accreta) - Hysterotomies other than LTCS or LVCS (especially T-incisions) - Macrosomia (large babies) - BMI over 30 - Arrest of Descent for previous section

Results

Proposed Questions	Findings
What percentage of all CDH deliveries are TOLACs?	114/2703 = 4.22% Only 498 were possible TOLACs
How many TOLACs do we induce vs. how many come in in Spontaneous Labor?	52/114 (45.6%) came in SL 62/114 (54.4%) were IOL 17% (9) of SL were CS 22% (14) of IOL were CS
What percentage of our TOLACs end up with Uterine Rupture? What about Uterine Scar Dehiscence?	Uterine Rupture: 1/114 = 0.8% Dehiscence?? - inconsistent documentation
What percentage of our TOLACs successfully VBAC?	76% Successful TOLAC 27% Unsuccessful TOLAC
Does the VBAC success score make a difference in predicting successful VBAC?	Avg Unsuccessful VBAC Success Score = 59.5% Avg Successful VBAC Success Score = 70.8%
Does time in labor affect success of VBAC?	Inconclusive data due to documentation issues



Discussion

Key Limitation:

This data is only from NM CDH over the span of a year. The data set only had 114 patients. With a larger data set, more comprehensive conclusions could be drawn. Time was also a limitation. With only about 8 weeks to look through a lot of charts, there is so much more that can be found in this data set, if looked at closer. Also, Epic documentation is inconsistent, which impacts the ability to pull data reports efficiently, leaving less time to analyze them.\

Comparisons Between CDH and National Averages (ACOG):

	CDH	National Average
Successful VBAC	76%	60%-80%
Uterine Rupture	0.8%	0.5%-1%

Discussions/Future Work:

CDH is comparing to the national average on delivering TOLAC care. The uterine rupture rate is skewed due to such a small denominator. If more TOLAC candidates were studied over a broader time frame, the rupture rate as well as successful VBAC rate could be better indicators of our performance. Due to our time limitations, we were not able to analyze this data set as thoroughly as we would have liked to. In the future, further examination of this data set can be used to try to find trends between labor length, uterine scar dehiscence, BMI, IOL, or even maternal age have on the chances of a successful VBAC.

Conclusions

TOLACs are an important option in the process of labor for women who have previous C-Sections. With the known benefits of a VBAC, it is important to research this topic so that TOLACs became safer and easier for women. At CDH, TOLACs are a safe and viable option for most women who choose so. With a UR rate of 0.8%, CDH is very comparable to the national average. This data set showed zero maternal mortalities and zero hysterectomies in TOLAC patients between April 2022 through March 2023. In the future, analyzing trends in relation to BMI, looking at the relationship between time and labor and likelihood of an emergency c-section, and what about the IOL makes a successful VBAC less likely would all help health care providers better counsel and identify patients who would be successful TOLACs.

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