



Pathologic Retraction Ring Found During Cesarean Section Following Failure to Progress in Labor

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Introduction

A pathological **retraction ring**, also known as **Bandl's ring**, is a rare contraction of the uterus at the junction of the upper and lower uterine segment. This pathology is usually the result of **obstructed labor**. It is a progressive thickening and retracting of the upper uterus and thinning/swelling of the lower uterus, resembling a ring¹⁻³

Due to its abnormal shape, the uterine ring may be palpated abdominally but is seldom felt vaginally⁴⁻⁵. It has an estimated prevalence of **0.02%** of live births, but it is suggested that the number is **underreported** due to lack of recent research^{1,6,7}. Most diagnoses are **given after active labor or during c-section**^{3,6,8}. For this reason, it is unclear whether it is a **cause or effect** of difficult delivery^{1,6,7}

Potential **risk factors** include use of oxytocin, prolonged labor, premature rupture of membranes, and fetal malposition^{6,7,9}

Interestingly, there is a similar pathology called a uterine **constriction ring**, and commonly these terms are used interchangeably although some publications have outlined their discrepancies. Figure 1 further highlights these differences^{2-5,9,10}

The band like effect of the pathology can cause **trapping** of a presenting fetal body part (usually head/neck/shoulders), thus **preventing or prolonging delivery**^{4,8-12}

It was previously associated with poor fetal outcomes and risk of uterine rupture, but more current research and increased frequency of cesarean sections has made mortality rare^{1,3-5,7,12}

The current treatment of retraction rings is **prompt delivery via cesarean section**. Tocolytics may be initiated to relax uterus^{3,10,11,13}

Figure 1. Retraction vs Constriction Ring

Pathologic Retraction Ring (Bandl's Ring)	Pathologic Constriction Ring
Present at junction of upper and lower uterine segment	Occurs at any level of the uterus
Only present during obstructed labor ; present during 2nd stage of labor	May occur during any stage of labor, but usually 2 nd stage, if present during third stage, will see typical "hourglass" uterus
May be palpable in umbilical region of abdomen, seldom felt vaginally	Sometimes felt vaginally , rarely felt abdominally
Gradual rising to high position	Does not vary in position during labor
Part of child usually felt during labor, mom usually exhausted	Child may be fully or mainly above ring, mom usually in good condition
May indicate a rupture is imminent with progressive thinning of lower segment	May be relieved by antispasmodics or anesthetics
Relieved by delivery of fetus via C-section	

Figure 2. Fetal Station¹⁴

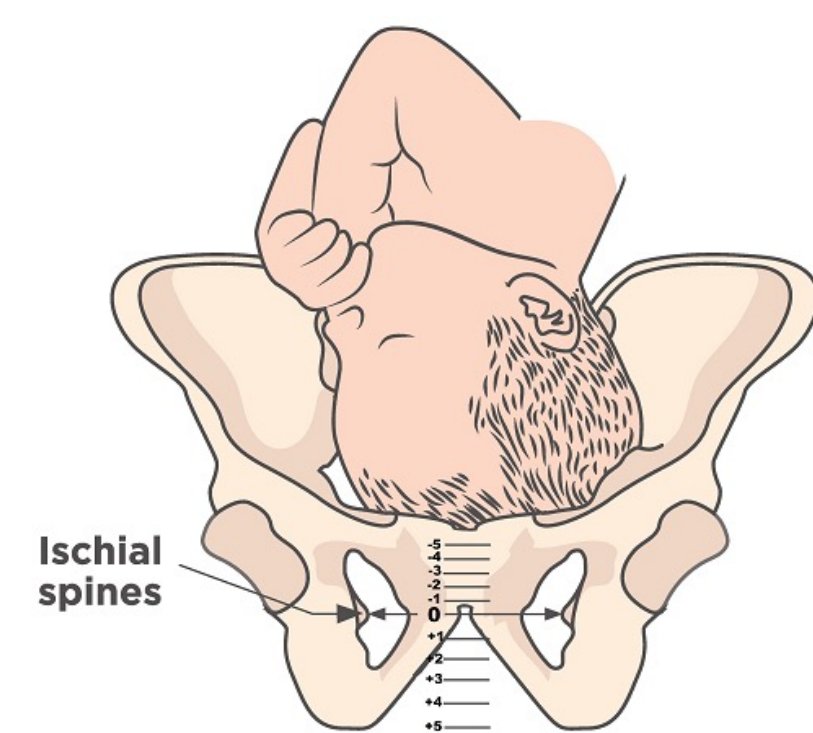


Figure 3. Bandl's Ring Anatomy¹⁵

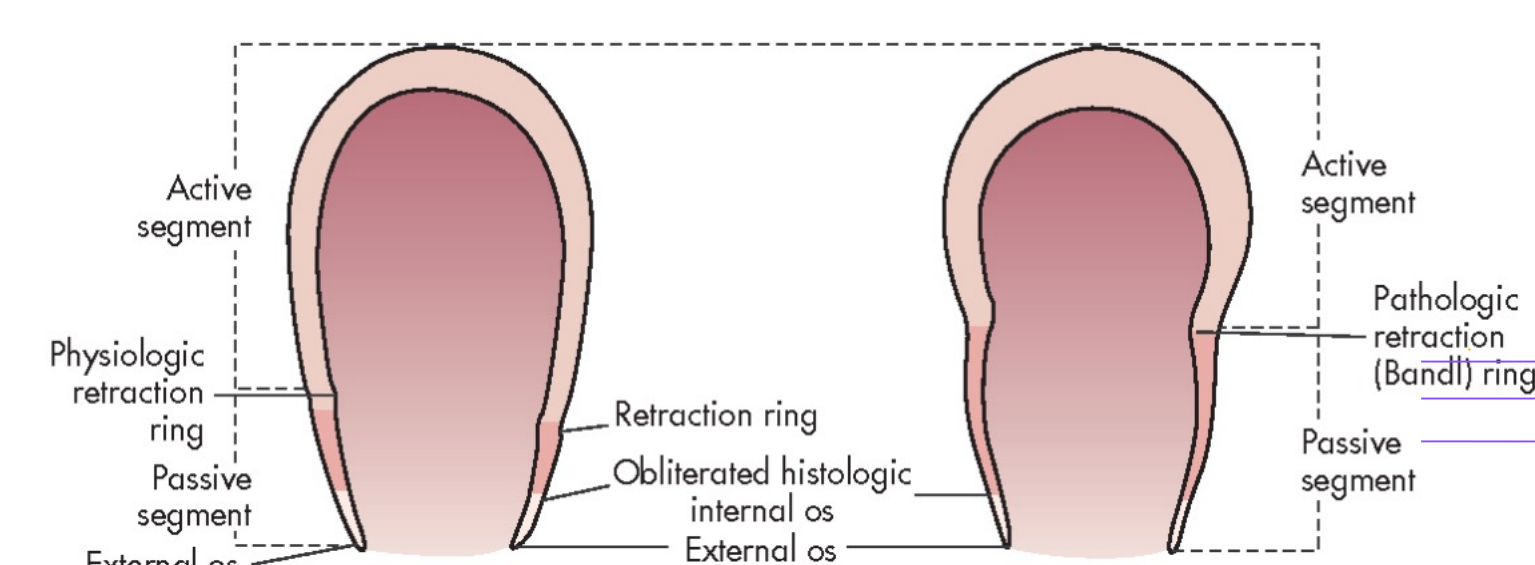


Figure 4. Labor Summary

Augmentation of labor	Pitocin given during latent first stage, amniotomy
1st stage of labor:	16.5 h
Latent phase:	13.5 h
Active phase:	3 h
2nd stage of labor:	4.5 h
AROM-delivery	7.5 hours

Case Description

Patient History

A 25 year old G2P1 Asian female presents for induction of labor at 40 weeks and 2 days gestation for **decreased fetal movement** and **painful contractions**.

The patient arrived in the **latent phase** of labor at **4 cm dilated, 60% effaced**, and **-1 station** with bulging membranes and infrequent contractions.

Fetal Heart Tracing Category I, GBS (-)

She underwent induction of labor including **supplemental oxytocin** and **amniotomy**

Ultrasound showed **direct occiput posterior** position and an unengaged fetus

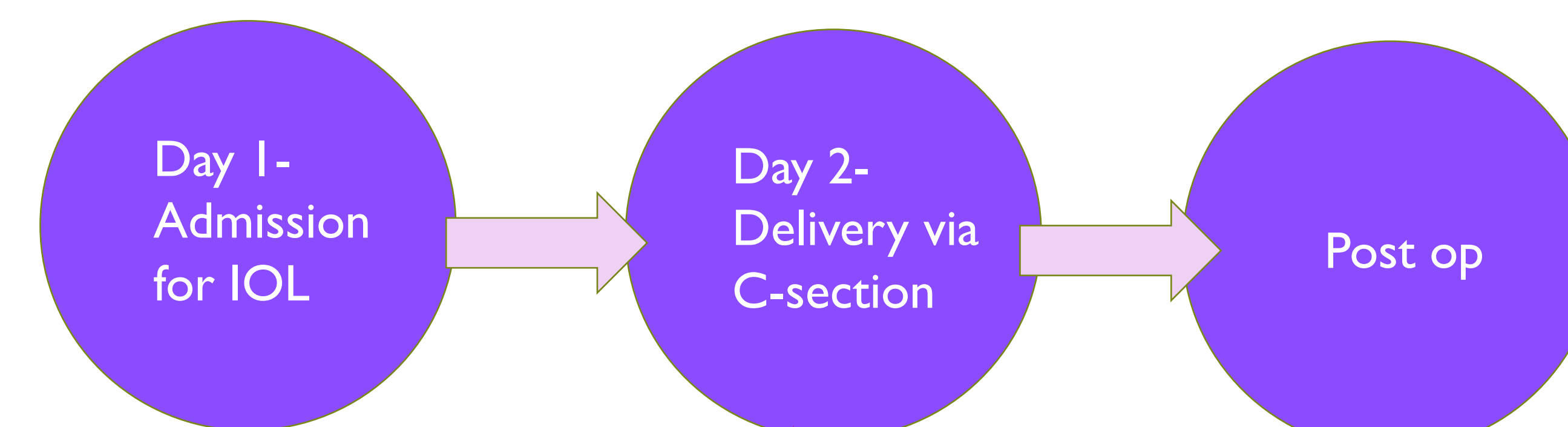
She had one previous pregnancy, vaginal delivery 6lb9oz, significant for **PUPPP rash postpartum**

Past medical history includes functional neurologic disorder with migraines and seizure like episodes, PTSD, anxiety, depression

Pregnancy complications include Iron and B12 deficiency, gestational thrombocytopenia

Current medications include prenats, cobalamin (B12) 1000 mcg daily, ferric carboxymaltose 750 mg in 2 doses every week

Hospital Course



Cervical Exam that morning 8cm/100%/-2 Patient in position for pushing early afternoon Trial of pushing for an hour, laboring down for an hour, another trial of pushing for 30 minutes

During that time, contracting every min, **+2 position when pushing but -2 at rest**. Labia and vaginal tissue become edematous. Patient becomes tachycardic, temp 100.4F, satting 85-90% on room air. At that time, supplemental oxygen is given Patient becomes dizzy, notes "seeing stars" when pushing

Recurrent early decelerations down to 70 bpm for <10 s

Patient elects for C-section and diagnosed with failure to progress

Abnormally shaped abdomen noted on operating table

- **Bandl's ring pathology** seen during C-section

Post op day 1- close observation and follow up labs

Discharged on post op day 3 without complications

Discussion

Patient Outcomes:

C-section was performed at 40w3d gestation. A baby boy was born at 9lbs 9oz in **direct occiput posterior** position **8/9 APGAR** given at 1/5 minutes

No visible trauma to fetal head, extraction during c-section was uncomplicated, **no signs of distress** to baby, minimal blood loss **Bandl's ring retraction** noted on patients' uterus

- Possible explanation for why patient was unable to maintain fetal position at rest

Patient had an **uncomplicated postpartum course**. She was relieved of the excessive pain and discomfort following delivery. She was **discharged on post op day three**.

Discussion Points:

- If the pathology was detected on ultrasound during difficult labor, patient may have elected to have a C-section sooner
- If the topic was more well known/taught in medical education, this patient would have fit the clinical picture and perhaps recognized earlier on
- There is a lack of medical consensus on this topic as well as current published guidelines for treatment/recognition
- Retraction rings should be considered in patients with similar clinical presentations (i.e. pain out of proportion to exam, diffuse edema, failure to maintain fetal position, etc)

Conclusion

Bandl's ring is a rare pathology associated with obstructed labor. In the past, it was associated with poor fetal outcomes, but very few current studies exist on the topic. Delay in recognition could lead to poor outcomes, therefore serial ultrasounds and abdominal exams should be performed if the pathology is suspected. Further standard of care and guidelines are needed for this pathology. In addition, distinctions between retraction rings and constriction rings should be made apparent as they are commonly used interchangeably, and this might skew the research headed towards recognition and prevention

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