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/dwelling of the lower uterus, resembling a ring.

Due to its abnormal shape, the uterine ring may be palpated abdominally but is seldom felt vaginally. It has an estimated prevalence of 0.02% of live births, but it is suggested that the number is underestimated due to lack of recent research. Most diagnoses are given after active labor or during c-section. For this reason, it is unclear whether it is a cause or effect of difficult delivery.

Potential risk factors include use of oxytocin, prolonged labor, premature rupture of membranes, and fetal malpositions.

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.

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.

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.

The current treatment of retraction rings is prompt delivery via cesarean section. Tocolytics may be initiated to relax uterus.

Case Description

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 6lbs 9oz, 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 prenatal, 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, sitting position.

If pain out of proportion to exam, supplemental oxygen is given and patient is closely observed and another trial of pushing for 30 minutes

If no further progress, patient is given amniotomy

Patient becomes very distressed and is found to have a Bandl's ring pathology.

If pathology is found during c-section, patient will be discharged on post op day three.

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

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 1/2 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

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 should be made apparent as they are commonly used interchangeably, and this might skew the research headed towards recognition and prevention.

References


14. Pathologic Retraction Ring (Bandl's Ring)

- Present at junction of upper and lower uterine segment

- May occur during obstructed labor, present during 2nd stage of labor

- May be palpable in umbilical region of abdomen, seldom felt vaginally

- Gradual rising to high position

- Part of child usually felt during labor, mom usually exhausted

- May indicate a rupture is imminent with progressive thinning of lower segment

- Relieved by delivery of fetus via C-section

15. Pathologic Constriction Ring

- Occurs at any level of the uterus

- May occur during any stage of labor, but usually 2nd stage, if present during third stage, will see typical "hourglass" uterus

- Sometimes felt vaginally, rarely felt abdominally

- Does not vary in position during labor

- Child may be fully or mainly above ring, mom usually in good condition

- May be relieved by antispasmodics or anesthetics

16. Figure 1. Retraction vs Constriction Ring

17. Figure 2. Fetal Station

18. Figure 3. Bandl's Ring Anatomy

19. Figure 4. Labor Summary

20. Day 1 - Admission for IOL

21. Day 2 - Delivery via C-section

22. Post op

23. Figure 5. Fetal Station

24. Figure 6. Labor Summary

25. Figure 7. Pathologic Retraction Ring

26. Figure 8. Pathologic Constriction Ring

27. Figure 9. Ultrasound

28. Figure 10. Pathologic Uterine Rings

29. Figure 11. Pathologic Retraction Ring

30. Figure 12. Pathologic Constriction Ring

31. Figure 13. Bandl's Ring Anatomy

32. Figure 14. Labor Summary

33. Figure 15. Pathologic Retraction Ring

34. Figure 16. Pathologic Constriction Ring

35. Figure 17. Ultrasound

36. Figure 18. Pathologic Uterine Rings

37. Figure 19. Pathologic Retraction Ring

38. Figure 20. Pathologic Constriction Ring

39. Figure 21. Bandl's Ring Anatomy

40. Figure 22. Labor Summary

41. Figure 23. Pathologic Retraction Ring

42. Figure 24. Pathologic Constriction Ring

43. Figure 25. Ultrasound

44. Figure 26. Pathologic Uterine Rings

45. Figure 27. Pathologic Retraction Ring

46. Figure 28. Pathologic Constriction Ring

47. Figure 29. Bandl's Ring Anatomy

48. Figure 30. Labor Summary

49. Figure 31. Pathologic Retraction Ring

50. Figure 32. Pathologic Constriction Ring

51. Figure 33. Ultrasound

52. Figure 34. Pathologic Uterine Rings

53. Figure 35. Pathologic Retraction Ring

54. Figure 36. Pathologic Constriction Ring

55. Figure 37. Bandl's Ring Anatomy

56. Figure 38. Labor Summary

57. Figure 39. Pathologic Retraction Ring

58. Figure 40. Pathologic Constriction Ring

59. Figure 41. Ultrasound

60. Figure 42. Pathologic Uterine Rings

61. Figure 43. Pathologic Retraction Ring

62. Figure 44. Pathologic Constriction Ring

63. Figure 45. Bandl's Ring Anatomy

64. Figure 46. Labor Summary

65. Figure 47. Pathologic Retraction Ring

66. Figure 48. Pathologic Constriction Ring

67. Figure 49. Ultrasound

68. Figure 50. Pathologic Uterine Rings

69. Figure 51. Pathologic Retraction Ring

70. Figure 52. Pathologic Constriction Ring

71. Figure 53. Bandl's Ring Anatomy

72. Figure 54. Labor Summary