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ANAL INCONTINENCE AFTER PRIMARY REPAIR OF OBSTETRIC SPHINCTER TEARS IS RELATED TO THE RELATIVE LENGTH OF THE RECONSTRUCTED EXTERNAL ANAL SPHINCTER: A CASE CONTROL STUDY

Hypothesis / aims of study

Although some studies have shown favourable outcome after primary repairs where injuries to the internal anal sphincter (IAS) were intentionally reconstructed, the impact of IAS reconstruction on outcome after obstetric sphincter tears remains unclear. The aim of the study was to determine if anatomic primary repair with end-to-end reconstruction of the external anal sphincter (EAS) and separate repair of eventually coexisting IAS tear results in lower incidence of moderate to severe incontinence and better anal sphincter integrity compared with conventional primary repair where tears to the IAS are neither looked for nor intentionally reconstructed.

Study design, materials and methods

Women who sustained 3rd or 4th degree obstetric sphincter tears were included prospectively following anatomic primary repair at the study hospital after a five-months teaching programme. Women treated with conventional primary repair at the same hospital prior to the onset of the teaching programme comprised the control group. These women were identified retrospectively via the hospital's electronic patient records, and offered inclusion to the follow-up study. Exclusion criteria were previous obstetric sphincter tear, subsequent delivery or pregnancy with gestational age > three months, inflammatory bowel disease, neurological disease and previous or subsequent anorectal surgery. The follow-up was identical for the two groups. Incontinence was classified according to St Mark's score. Moderate to severe incontinence was defined as St Mark's score ≥ 3. Three-dimensional anal ultrasound (3D-AUS) images were assessed by the first author classifying defects of EAS and IAS three-dimensionally according to a validated AUS defect score system(1), where a total score of 0 is no defect and a score of 7 is a maximal defect. The AUS assessments were performed blinded to all other data more than two years after the last investigation was undertaken and more than two years after a previous AUS assessment of the control group.

A power calculation was undertaken based on a previous report from the study hospital and the results following anatomic primary repair at another hospital. In order to show a reduction in moderate to severe incontinence from 42% to 15% with a power of 0.90 using a two-sided test and alpha at 5%, some 57 patients would be needed in each group.

Results

Some 61 women accepted inclusion in the control group, comprising 39% of all women who sustained obstetric sphincter tears in a 31-month period prior to onset of the teaching programme. Results from the control group have partly been published previously(2). A total of 63 women were included in the study group, comprising 74% of all women who sustained obstetric sphincter tears during the inclusion period (table 1). There was no difference in the incidence of 3a, 3b or 4th degree tears between the groups, or between included and not-included women. In the study group an IAS tear was identified during repair in 17 (27%) of the women. Mean time to follow-up was 11 months (range 9-17) in the study group compared with 21 months (range 9-34) in the control group (p<0.001). Obstetric and demographic data are shown in table 2.

The incidence of incontinence with St Mark's score ≥3 was 14% in the study group compared with 39% in the control group (p=0.002). Among women who had not delivered vaginally prior to the tear, St Mark's score ≥3 was reported by 10% in the study group versus 38% in the control group (p=0.002). The corresponding numbers among women who had delivered vaginally prior to the tear was 36% and 43% respectively (n.s.). In the study group the AUS were interpreted as normal in 8%, isolated EAS defects in 79% and combined IAS/EAS defects in 13%, while the corresponding findings in the control group was 2%, 74% and 24% respectively (n.s.). Separate analysis of the various AUS defect score parameters revealed that 42% in the study group had an EAS defect exceeding 50% of the sphincter length compared with 71% in the control group (p=0.003). In multivariate logistic regression analysis adjusting for factors affecting the EAS sphincter length as a dichotomous variable (defect more or less than 50% of the sphincter length), mode of repair significantly contributed to the equation (p=0.007) while previous vaginal delivery or degree of tear (3rd degree versus 4th degree) did not (p=0.35 and p=0.13 respectively). Mean St Mark's score was 1.1 in women with EAS defects ≤ 50% of the sphincter length compared with 2.3 in women with EAS defects > 50% (95% CI of the difference 0.15 – 2.13, p=0.025). There was an overall correlation between the St Mark's score and the AUS defect score (p=0.017).

Interpretation of results

The incidence of moderate to severe incontinence was significantly lower in the study group compared with the control group, but the favourable outcome was not obtained for women who had delivered vaginally prior to the tear. Pre-existing sphincter defects due to occult sphincter tears during previous deliveries may be an explanation to this finding. Although the intention was to reconstruct coexisting IAS tears in the study group, follow-up AUS showed no difference in the frequency of IAS defects between the study group and the control group. In a multivariate analysis the relative length of EAS defects differed between the two groups. St Mark's score was also higher in women with EAS defects > 50% of the sphincter length than in women with shorter EAS defects.

Concluding message

The improved continence following the attempt of anatomic primary repair was associated with a better reconstruction of the EAS length. Women with a history of vaginal delivery prior to the sphincter tear had an inferior outcome regardless mode of repair.

Table 1 Reasons for exclusion from the study group (anatomic primary repair) and the control group (conventional primary repair)

	Study group	Control group
Total number of tears during the inclusion period	85	155
Included women	63 (74%)	61 (39%)
Reasons for exclusion		
Declined participation	3 (4%)	28 (18%)
Subsequent pregnancy/delivery	2 (2%)	20 (13%)
Previous obstetric sphincter tear	8 (9%)	9 (6%)
Previous or subsequent anorectal surgery	0	3 (2%)
Did not respond to follow-up requests	3 (4%)	34 (22%)
Locum obstetrician on call	4 (5%)	-
Communication difficulties	1 (1%)	-
Unknown	1 (1%)	-

Table 2 Obstetric and demographic data among included women.

	Study group (n=63)	Control group (n=61)
One or more vaginal deliveries prior to the tear	11 (17%)	20 (33%)*
Caesarean section only prior to the sphincter tear	7 (11%)	9 (15%)
Epidural during delivery	13 (21%)	16 (26%)
Birth weight	3800 g	3850 g
Episiotomy	22 (25%)	22 (24%)
Vacuum extraction	13 (21%)	14 (22%)
Forceps delivery	3 (5%)	2 (3%)
Repaired at the operating theatre	22 (35%)	3 (5%)**
Repaired under regional or general anaesthesia	36 (57%)	19 (31%)***
Repair performed or assisted by consultant	36 (57%)	44 (72%)

*p=0.031, **p<0.001, ***p=0.004

References

1. Norderval S, Dehli T, Vonen B. Three-dimensional endoanal ultrasonography: intraobserver and interobserver agreement using scoring systems for classification of anal sphincter defects. Ultrasound Obstet.Gynecol. 2009; 33: 337-43.

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Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**