

OBSTETRICS

Long-term anal incontinence after obstetric anal sphincter injury—does grade of tear matter?

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BACKGROUND: Anal incontinence is a major concern following delivery with obstetric anal sphincter injury (OASIS), and has been related to the degree of sphincter tear.

OBJECTIVE: The aims of this study were (1) to evaluate whether women with a fourth-degree OASIS in the first delivery have an increased risk of long-term anal and fecal incontinence after a second delivery, and (2) to assess the impact of mode of second delivery on anal incontinence and related symptoms in these patients.

MATERIALS AND METHODS: We performed secondary analyses of a national questionnaire study in all Danish women with an OASIS in their first delivery and 1 subsequent delivery, both deliveries in 1997 to 2005. The questionnaires were sent a minimum of 5 years since the second delivery. In Denmark, women with anal incontinence after a delivery with OASIS are recommended elective cesarean deliveries in subsequent pregnancies. We performed uni- and multivariable logistic regression analyses to evaluate the outcomes.

RESULTS: In total, 2008 patients had an OASIS, of whom 12.2% ($n = 245$) had a fourth-degree tear in the first delivery. The median follow-up time since the first delivery with OASIS was 11.6 years (IQR, 10.2–13.2 years) and since the second delivery 8.5 years (IQR, 7.1–10.1 years). Women with a fourth-degree sphincter injury in the first delivery were at higher risk for anal incontinence (58.8%, $n = 144$) as well as fecal incontinence (30.6%, $n = 75$) than patients with a third-degree injury in the first delivery (41.0%, $n = 723$, and 14.6%, $n = 258$, respectively). The

differences between groups persisted after adjustment for important maternal, fetal, and obstetric characteristics (adjusted odds ratio [aOR], 2.14; 95% confidence interval [CI], 1.52–3.02; $P < 0.001$ for anal incontinence; and aOR, 2.49; 95% CI, 1.73–3.56; $P < 0.001$ for fecal incontinence). In subgroup analyses of patients with fourth-degree anal sphincter injury in the first delivery, the mode of second delivery was not associated with the risk of anal incontinence (aOR, 0.97; 95% CI, 0.41–1.84; $P = 0.71$) or fecal incontinence (aOR, 1.28; 95% CI, 0.65–2.52; $P = 0.48$). The effect of the mode of the second delivery did not differ between women with a fourth-degree OASIS and those with a third-degree injury with regard to both anal ($P = 0.09$) and fecal ($P = 0.96$) incontinence.

CONCLUSION: After a second delivery, women with a fourth-degree OASIS in the first delivery have a higher risk of long-term anal and fecal incontinence than women with a third-degree sphincter injury. Adjusted odds of long-term anal and fecal incontinence did not differ significantly by mode of second delivery. Women with a fourth-degree OASIS should be informed about the increased risk of long-term anal incontinence and advised that subsequent elective cesarean delivery is not protective.

Key words: anal incontinence, fecal incontinence, fourth-degree laceration, long-term follow-up, mode of delivery, obstetric anal sphincter injury

Anal incontinence (AI) is a major concern after delivery with obstetric anal sphincter injury (OASIS) and occurs in approximately 50% of cases at long-term follow-up.^{1–3} AI is defined as involuntary loss of flatus or feces, whereas fecal incontinence (FI) is involuntary loss of solid and/or liquid feces.⁴ The severity of AI has previously been related to the degree of OASIS, that is, dependent on the involvement of the external and internal sphincter and whether the rectal mucosa has been affected.^{5–7}

Women with a fourth-degree OASIS have an increased risk of recurrent OASIS in their second delivery compared to women with a third-degree OASIS.⁸ We have previously shown that recurrent OASIS increases the risk of AI.⁹ To avoid aggravation of AI symptoms, cesarean delivery has been proposed to be protective. However, earlier findings could not prove a protective effect of elective cesarean delivery in the second delivery after controlling for important maternal, fetal, and obstetric characteristics.¹

Most previous studies evaluating the risk of long-term AI after fourth-degree OASIS are small^{6,7,10,11} and thus underpowered to evaluate the impact of mode of second delivery. Therefore, there is an urgent need for further knowledge to ensure sufficient information to women with a fourth-degree OASIS when deciding on mode of

delivery in subsequent pregnancies. We hypothesized that women with a fourth-degree OASIS would have an increased risk of long-term AI over that of women with a third-degree OASIS due to the larger tear. Also, we thought that the protective effect of an elective cesarean delivery in subsequent deliveries might be greater than for women with a third-degree OASIS in the index delivery, because women with a fourth-degree OASIS have more scar tissue and thus increased risk of further weakening of the tissue. The first objective of the present study was to assess whether women with fourth-degree OASIS in the first delivery have an increased risk of long-term AI compared to women with a third-degree OASIS in the first delivery. The second objective was to evaluate the impact of mode of second delivery in women with a fourth-degree OASIS on AI-related symptoms.

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Materials and Methods

Study Subjects and Design

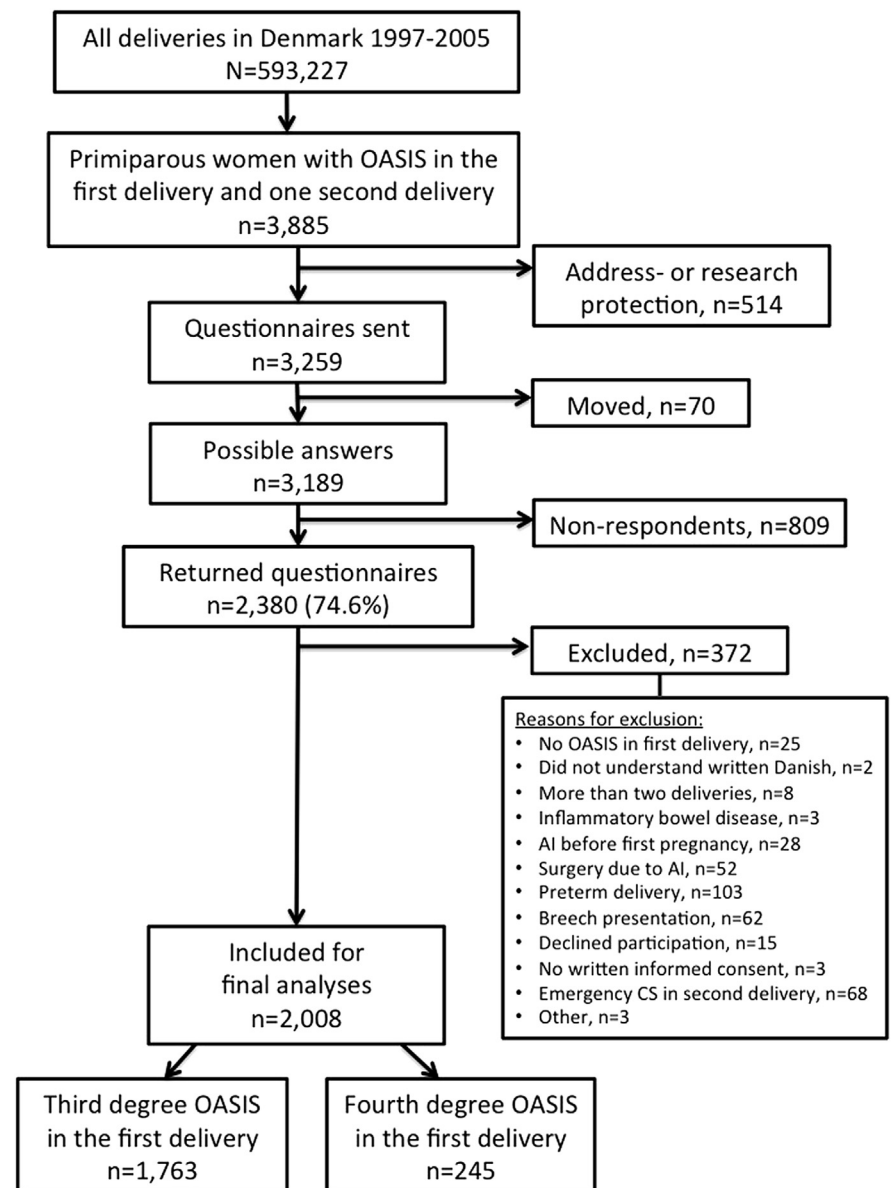
We performed secondary analyses of a national validated questionnaire study, which was previously described in detail.¹ All patients with a first delivery with OASIS and 1 subsequent delivery in Denmark were included. Both deliveries were between January 1, 1997, and December 31, 2005. The questionnaires were sent out between October 1, 2010, and May 31, 2011 to allow a minimum follow-up of 5 years since the second delivery. Nonrespondents received a reminder after 1 month.

The questionnaire consisted of questions regarding AI and related symptoms, based on the previously validated questionnaire.¹² The questionnaire was validated by interviews and test–retest. The Danish National Board of Health (corresponding to the US Food and Drug Administration) approved the study (J.nr. 7-505-29-1562). In Denmark, research involving questionnaires only does not require approval from the National Committee on Health Research Ethics. All participants signed an informed consent form.

Degree of OASIS in Denmark is classified according to the Royal College of Obstetricians and Gynaecologists (RCOG) classification; a third-degree OASIS is defined as a partial or complete disruption of the anal sphincter muscles, which may involve either or both the external and internal anal sphincter muscles, whereas a fourth-degree OASIS is defined as a disruption of the anal sphincter muscles with a breach of the rectal mucosa.¹³ Differentiation between partial and complete third-degree OASIS was not present in the Danish Medical Birth Registry at this time; thus, the present study compared patients with a fourth-degree OASIS to patients with a third-degree OASIS.

The main outcomes of the present study were AI and FI at long term, that is, at the time of answering the questionnaire that was sent to the women a minimum of 5 years since the second delivery. AI was defined as a positive answer to the question “Do you experience involuntary leakage of flatus and/or

FIGURE 1
Selection of patients for final analyses



AI, anal incontinence; CS, cesarean section; OASIS, obstetric anal sphincter injury.

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liquid or solid stool?” FI was defined as a positive answer to either of the 2 questions “Do you experience involuntary leakage of liquid stool?” or “Do you experience involuntary leakage of solid stool?” Secondary outcomes were answers to other questions regarding fecal urgency (defined as inability to defer defecation for 15 minutes), difficulty to wipe clean after defecation,

ability to differentiate between gas and stool in the rectum, anal pain during or after defecation, FI without noticing until afterward, and whether the AI-related symptoms affected quality of life.

Patients with nonsingleton pregnancies, more than 2 deliveries, breech delivery, anal incontinence before the first delivery, inflammatory bowel disease, surgery due to anal incontinence,

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