

Long-term Pelvic Floor and Sexual Health After Obstetric Anal Sphincter Injury in Finland

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Study protocol

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Background

In Finland, anal sphincter rupture occurs in approximately 1.6% of vaginal deliveries.¹ Perineal tears are typically repaired immediately in the delivery room, and sphincter injuries are most often repaired shortly after delivery in an operating room. It is important to attempt to prevent sphincter injuries, as damage to the anal sphincter is a significant cause of fecal incontinence in women, which negatively affects quality of life in many ways. In previous data from Tampere University Hospital (Tays), 64% of women were asymptomatic six months after sphincter repair, whereas 36% continued to experience symptoms.²

Previous studies suggest that prior sphincter injury affects the number of children women have.³ Many women report that symptoms following sphincter injury significantly reduce their quality of life.⁴ Common symptoms include inability to control stool or gas,⁵ but sexual dysfunction and overall impact on quality of life have also been reported.

A Dutch study assessed sexual function and quality of life 2–11 years after injury using questionnaires. Sexual dysfunction was reported by 19 out of 32 respondents.⁶ In this study, more severe tears were associated with poorer quality-of-life scores. Similarly, a French study reported that 17 out of 160 women experienced frequent dyspareunia and 24 out of 160 suffered from chronic pelvic pain 1–12 years after injury.⁷

International studies suggest that fecal incontinence is more common following more severe tears.⁸ On the other hand, most women appear to remain asymptomatic in long-term follow-up.⁹ Episiotomy has been considered protective against sphincter injury but has been associated with an increased risk of long-term fecal incontinence. Evidence regarding its effects on sexuality is inconsistent, although it has been linked to dyspareunia.¹⁰¹¹¹²

International findings are difficult to generalize to Nordic countries, particularly Finland, due to differences in childbirth practices. In Nordic countries, midwives play a significantly larger role, operative deliveries are less frequent, and high-quality care is universally available. Finnish midwives traditionally support the perineum carefully during birth (“Finnish maneuver”), and adoption of this technique has reduced tear rates in Norway.¹³

There is limited Finnish research on the long-term consequences of sphincter injuries. This study forms the second and third parts of a three-part doctoral thesis. The first publication examined mode of delivery and recurrence risk in subsequent deliveries following sphincter injury. The majority (78%) of women planned vaginal delivery, and recurrence was rare (1.9%). The article was published in July 2025 in *BMC Pregnancy and Childbirth*.¹⁴

Objectives

The aims of this study are to:

- determine the prevalence of long-term pelvic floor symptoms and sexual dysfunction after sphincter injury
- identify factors that predispose to long-term symptoms
- assess the impact of sphincter injury on desired family size and identify factors associated with having fewer children than planned
- evaluate satisfaction with mode of delivery choice in a subsequent delivery and associated factors

Materials and Methods

The study population consists of individuals who gave birth at Tays between 2009 and 2021 and whose delivery was complicated by sphincter injury (n = 580). Data on all pregnancies and births treated at Tays for these individuals will be collected from patient records.

Participants will receive by mail an information sheet, a consent form, and two questionnaires:

- PISQ-12 (assessing sexual function)
- PFDI-20 (assessing pelvic floor dysfunction)

These questionnaires have also been validated in Finnish.¹⁵ Additional questions will address family size, and women who have delivered after the injury will be asked about their choice of delivery mode.

Participants may return paper forms or complete the consent and questionnaires electronically. A reminder will be sent once if no response is received within two months.

Personal identifiers will be replaced with study IDs, and data will be processed in pseudonymized form. Data will be stored and analyzed in a secure environment. Questionnaire responses will be compared with clinical background data to identify risk factors for long-term symptoms, reduced family size, and satisfaction with delivery mode choice. Statistical analyses will be performed using SPSS.

Paper questionnaires will be stored securely in locked facilities. After the active phase, electronic data will be archived, and all data will be destroyed upon completion of the study.

Timeline and Implementation

Ethics approval will be sought in early 2026. After approval, questionnaires will be distributed. Data collection is planned for 2026, with articles written during 2027–2028.

The study will be conducted at the Faculty of Medicine at Tampere University as part of a doctoral project supervised by Elli Toivonen (MD, PhD) and Docent Outi Palomäki. Articles will be submitted to high-quality international journals.

Strengths and Limitations

This study will provide important information on long-term consequences of sphincter injury among Finnish women. Detailed clinical data combined with questionnaire responses will enable identification of risk factors. The results may improve targeted rehabilitation and prevention strategies.

References

1. Perinataaltilasto – synnyttäjät, synnytykset ja vastasyntyneet. THL. October 6, 2025. Accessed November 5, 2025. <https://thl.fi/tilastot-ja-data/tilastot-aiheittain/seksuaali-ja-lisaantymisterveys/synnyttajat-synnytykset-ja-vastasyntyneet/perinataaltilasto-synnyttajat-synnytykset-ja-vastasyntyneet>
2. Kuismanen K. Synnytys ja sulkijalihasrepeämä. *Duodecim*. 2019;135:818-823.
3. Elfaghi I, Johansson-Ernste B, Rydhstroem H. Rupture of the sphincter ani: the recurrence rate in second delivery. *BJOG*. 2004;111(12):1361-1364. doi:10.1111/j.1471-0528.2004.00138.x
4. Wegnelius G, Hammarström M. Complete rupture of anal sphincter in primiparas: long-term effects and subsequent delivery. *Acta Obstetrica et Gynecologica Scandinavica*. 2011;90(3):258-263. doi:10.1111/j.1600-0412.2010.01037.x
5. Evans E, Falivene C, Briffa K, Thompson J, Henry A. What is the total impact of an obstetric anal sphincter injury? An Australian retrospective study. *Int Urogynecol J*. 2020;31(3):557-566. doi:10.1007/s00192-019-04108-3
6. Visscher AP, Lam TJ, Hart N, Felt-Bersma RJF. Fecal incontinence, sexual complaints, and anorectal function after third-degree obstetric anal sphincter injury (OASI): 5-year follow-up. *Int Urogynecol J*. 2014;25(5):607-613. doi:10.1007/s00192-013-2238-0
7. Desseauve D, Proust S, Carlier-Guerin C, Rutten C, Pierre F, Fritel X. Evaluation of long-term pelvic floor symptoms after an obstetric anal sphincter injury (OASI) at least one year after delivery: A retrospective cohort study of 159 cases. *Gynécologie Obstétrique & Fertilité*. 2016;44(7):385-390. doi:10.1016/j.gyobfe.2016.05.007

8. Zacchè MM, Ghosh J, Liapis I, Chilaka C, Latthe P, Tooze-Hobson P. Anal incontinence following obstetric anal sphincter injury: Is there a difference between subtypes? A systematic review. *Neurourology and Urodynamics*. 2023;42(7):1455-1469. doi:10.1002/nau.25235
9. Young R, Bates L, The S, King J. Mode of delivery following obstetric anal sphincter injury: a 7-year retrospective review and follow-up cohort survey. *Int Urogynecol J*. 2022;33(12):3365-3369. doi:10.1007/s00192-022-05294-3
10. Levailant M, Legendre G, Rebmann Jr E, Hamel JF, Venara A. Obstetrical anal sphincter injury and unnecessary episiotomy are both associated with anal incontinence 8 years after childbirth: A nationwide database analysis. *International Journal of Gynecology & Obstetrics*. 2022;159(1):284-289. doi:10.1002/ijgo.14101
11. Cattani L, De Maeyer L, Verbakel JY, Bosteels J, Deprest J. Predictors for sexual dysfunction in the first year postpartum: A systematic review and meta-analysis. *BJOG*. 2022;129(7):1017-1028. doi:10.1111/1471-0528.16934
12. Chang SR, Chen KH, Lin HH, Chao YMY, Lai YH. Comparison of the effects of episiotomy and no episiotomy on pain, urinary incontinence, and sexual function 3 months postpartum: A prospective follow-up study. *International Journal of Nursing Studies*. 2011;48(4):409-418. doi:10.1016/j.ijnurstu.2010.07.017
13. Fretheim A, Tanbo T, Vangen S, Reinart LM, Røttingen JA. Use of manual techniques for perineal support in Norwegian maternity departments. *Tidsskrift for Den norske legeforening*. Published online November 29, 2011. doi:10.4045/tidsskr.11.0643
14. Ristilä E, Palomäki O, Huhtala H, Toivonen E. Mode of delivery and maternal outcome in subsequent delivery after an obstetric anal sphincter injury: a Finnish retrospective cohort study. *BMC Pregnancy Childbirth*. 2025;25(1):773. doi:10.1186/s12884-025-07882-9
15. Mattsson NK, Nieminen K, Heikkinen AM, et al. Validation of the short forms of the Pelvic Floor Distress Inventory (PFDI-20), Pelvic Floor Impact Questionnaire (PFIQ-7), and Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12) in Finnish. *Health Qual Life Outcomes*. 2017;15(1):88. doi:10.1186/s12955-017-0648-2