

# Sagittal synostosis – surgical outcomes and long-term follow up

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligen försvaras i hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, fredagen den 3 december 2021, klockan 09.00

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## Avhandlingen baseras på följande delarbeten

- I. Maltese G, Fischer S, Strandell A, Tarnow P, Kölby L. **Spring-assisted surgery in the treatment of sagittal synostosis: A systematic review.** *J Plast Surg Hand Surg* 2015 Jun; 49(3): 177-182
- II. Fischer S, Maltese G, Tarnow P, Wikberg E, Bernhardt P, Tovetjärn R, Kölby L. **Intracranial volume is normal in infants with sagittal synostosis.** *J Plast Surg Hand Surg* 2015 Feb; 49(1): 62-64
- III. Fischer S, Maltese G, Tarnow P, Wikberg E, Bernhardt P, Kölby L. **Comparison of Intracranial Volume and Cephalic Index After Correction of Sagittal Synostosis With Spring-assisted Surgery or Pi-plasty.** *J Craniofac Surg* 2016 Mar; 27(2): 410-413
- IV. Fischer S, Maltese G, Tarnow P, Wikberg E, Bhatti Søfteland M, Kölby L. **Comparisons of Intracranial Volume and Cephalic Index After Correction of Sagittal Craniosynostosis With Either Two or Three Springs.** *J Craniofac Surg* 2021 Jul;7 doi:10.1097/SCS.0000000000007870
- V. Fischer S\*, Unander-Scharin J\*, Bhatti Søfteland M, Nysjö J, Wikberg E, Maltese G, Lif H, Tarnow P, Enblad P, Kölby L, Nowinski D. **Springs vs H-craniectomy for sagittal synostosis: a two-center comparison of matched cases.** Manuscript

**SAHLGRENSKA AKADEMIN  
INSTITUTIONEN FÖR KLINISKA VETENSKAPER**



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## **Abstract**

The overall aim of this thesis was to evaluate and compare surgical outcomes in patients with sagittal synostosis operated with the most commonly used surgical methods in Sweden: craniotomy combined with springs, pi-plasty, or H-craniectomy.

**Paper I** is a systematic review that identified the evidence showing that spring-assisted surgery is as efficient as more extensive cranioplasties to be of very low quality, thereby emphasizing the need for more rigorous studies. The aims of the other papers were to determine intracranial volume (ICV) in a large cohort of children with sagittal synostosis and compare ICV and cephalic index (CI) between sagittal synostosis patients operated with either craniotomy combined with springs, pi-plasty, or H-craniectomy. Additionally, they compared the effect using two versus three springs on the ICV and CI. **Paper II** indicated that ICV is normal in infants with sagittal synostosis, **Paper III** determined that craniotomy combined with springs represents an equally effective surgical method to modified pi-plasty in terms of improving ICV and CI, and **Paper V** showed that craniotomy combined with springs is a better surgical method than H-craniectomy for correcting CI. Moreover, Paper V showed that craniotomy combined with springs resulted in a lower risk of comorbidities, such as blood loss and need for blood transfusion. Furthermore, **Paper IV** showed that three springs were more effective at improving CI than two springs, even in the long-term.

**Keywords:** sagittal synostosis, craniofacial surgery, spring-assisted surgery, intracranial volume, cephalic index