

## Development of Sacral Ratio Percentile Card for Children: A Preliminary Report

Kutay Bahadır , Bilgesu Arian-Ergun , Atilla Halil Elhan , Ergun Ergun , Tanju Aktug

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Abstract

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References



### Abstract

**Introduction** Sacrospinal anomalies that may accompany anorectal malformations may cause fecal and urinary incontinence despite proper anomaly treatment. The sacral ratio has been suggested in the determination of both the prognosis in terms of incontinence and the need for further examination for sacrospinal anomalies. The normal and clinically decisive values of sacral ratio are given differently in publications. We aimed to determine the distribution of the sacral ratio in children under 12 months and to develop the sacral ratio percentile card that will enable one to give an age-independent parametric result in clinical evaluations.

**Materials and Methods** The files of patients under 1 year of age who had anteroposterior direct radiography including pelvis were reviewed retrospectively. Sacral ratio was studied for 360 patients, 30 patients per month. Percentile card was developed with LMS software and reference values were used as 1, 2, 3, 4, and 10%.

**Results** The lowest sacral ratio value was 0.514 and the highest value was 0.936. There was no statistical difference between the mean sacral ratio of the cases when they were classified on a monthly basis ( $p = 0.191$ ). Low percentile values were found slightly different at first 4 months of age.

**Conclusion** Although the mean of sacral ratio does not change significantly during the first year of life, values that are considered pathological for patients are within different percentile limits depending on age. Instead of using sacral ratio with some clinically decisive values, we think that parametric evaluation with the help of the percentile card will increase its clinical value.

### Keywords

anorectal malformations - child - incontinence - sacral ratio - tethered cord

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# Development of Sacral Ratio Percentile Card for Children: A Preliminary Report

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## Keywords

- ▶ anorectal malformations
- ▶ child
- ▶ incontinence
- ▶ sacral ratio
- ▶ tethered cord

## Introduction

Anorectal malformations (ARMs) are congenital anomalies that occur in 1:5,000 live born infants and cause intestinal obstruction.<sup>1</sup> Patients with ARM may also have genitourinary, sacrospinal, gastrointestinal, and cardiovascular anomalies.<sup>1,2</sup> Surgical approach is the main treatment method of the anomaly.

Sacral anomalies accompanying ARM may cause bladder and bowel dysfunction or motor disorder and may result in fecal and urinary incontinence.<sup>3–5</sup> In patients with ARM, it is necessary to carry out investigations such as spinal ultrasound (US) and spinal magnetic resonance (MR) imaging, in order to determine whether there is a pathology that may cause fecal or urinary incontinence such as lack of some or all of the sacral vertebrae, butterfly vertebrae, hemivertebrae, or

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