

Preface

The term *axis* defines a straight line interconnecting the two poles of a spherical object. In biology, it denotes the imaginary central line of the body, or more specifically the vertebral column. The bones of the skull and the vertebral column together make up the portion of the skeletal system that is known as the *axial* skeleton. The vertebral column does not just geographically reside in the center of the body; it occupies such a position physiologically and functionally as well. Just as it is impossible for an object with a deviated axis to fulfill its predetermined function or structure, any deviation of the vertebral column from the normal will invariably affect the appearance and function of the whole body. An anomaly such as this appearing during the period of growth does not just exist in a limited period of time and constitute problems with a static nature, but changes with the passage of time and becomes a dynamic pathology.

Spinal disorders in small children have become one of the most heatedly discussed subjects of spinal surgery in the past few years. Impressive progress in corrective deformity surgery has paved the way for procedures usually reserved for adults and adolescents to be modified to be used for the treatment of spinal deformities in much younger children. However, the ability of perfectly correcting deformities in all three planes in skeletally mature patients has only solved part of the problem. It has also given rise to additional concerns, especially those regarding the loss of motion in the vertebral column. Minor or major loss of function in the short term and adjacent segment disease in the long term are inevitable results of these procedures. Yet, when the cosmetic and functional problems caused by the deformity at that moment and the potential complications associated with fusion in an undeterminable time in the future are weighed, usually the latter problem is preferred as applied in advanced deformities and corrective surgery. In younger children, however, a much graver problem arises that dwarfs in the aforementioned ones in scope: the loss of the growth potential of the spinal column. The inability of the *axial skeleton* to grow does not just mean the inability of the *axis* to grow. It affects the growth potential of the whole body. A spine not permitted to grow will result in a short trunk and an underdeveloped thorax. The complications that follow a thorax unable to develop are so huge as to not even be compared with those caused by a vertebral column that is short, immobile or a candidate for adjacent segment degeneration. Thoracic insufficiency is a life-threatening, or in the very least, profoundly quality-of-life altering complication.

The last decade of pediatric spinal surgery has been about trying to understand the causes and results of early onset scoliosis, identify coexisting problems, foreseeing new ones and solving them all. I sincerely hope that this book will be a contribution to this

struggle, however small it may be. The information contained in this book is derived from the valuable experiences of those spinal surgeons that are involved with the management of young children with spinal deformities in their day-to-day practice, and will, hopefully, assist the practice of every other surgeon interested in this subject while stimulating up and coming research into the field.

An important portion of the content of this book was covered during the pre-meeting course of the 28th EPOS Meeting in 2009 in Lisbon. Although they did not participate as speakers in this course at that time, Carol Hasler, Ilkka Helenius, Dror Ovadia and Thanos Tsirikos have kindly agreed to share their knowledge and experience for the creation of this book. Also, without the belief in and support of EFORT Secretary General and Lisbon EPOS Meeting host Manuel Cassiano Neves, the publication of this book would not be possible. We are able to have a book such as this because EFORT, one of the leading teaching organizations in orthopaedic surgery in the world, believed in the significance of this undertaking and never withheld its generous support.

I am proud to have been chosen to lead this project and would, once more, like to thank everybody involved for their contributions.

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Non-Idiopathic Spine Deformities in Young Children

Yazici, M. (Ed.)

2011, X, 175 p. 69 illus., 32 illus. in color., Softcover

ISBN: 978-3-642-19416-0