The Development of the paediGAV®

More than ten years after the introduction in the clinical practice, several thousands of patients in numerous countries have been successfully treated with the paediGAV®. The use of gravitational valves, also in the pediatric hydrocephalus, has proved itself as an important treatment option.

First considerations of paediGAV® arose already in 1996 based on the first scientific analysis of the treatment perspectives, in particular for normal pressure hydrocephalus after implantation of the DualSwitch valve. Many neurosurgeons considered the compensation of the hydrostatic pressure in adult patients obvious; in infants however, the concerns were numerous. Why should a pressure be compensated which could only be relevant for few and short moments, if at all? During the first few weeks and months of life, babies lie most of the time and are only in an upright position for a short period of time in order to burp. Furthermore, the hydrostatic pressure is very low due to the body size. Why a gravitation valve for infants?

The expectation after shunt introduction in infants was obvious:

The treatment was considered more successful the smaller the ventricles became. From numerous discussions I learned that in over 80% of the cases, the ventricles completely collapsed after implantation of a drainage. I found this treatment result very questionable. The early closure of the skull bones resulting in a too small intracranial volume for the physiological growth of the brain as well as the increased occurrence of thickened skull bones after early childhood shunt introduction were and are indication for continuous negative consequences. These observances were not and still are not brought in connection with an over drainage. Rather, the occurrence of an over drainage in infants was described as extremely seldom and unimportant in studies. And that is why collapsed ventricles are not yet seen as an over drainage or as complication.

This does not occur without reason:

With the background of the historical success of a life saving shunt system, the over drainage usually shows long term fatal consequences. Studies seem to show that the treatment success remains independent of the used valve. Surgical aspects superimpose the meaning of the valve function. To imagine that even light negative pressures can have very negative lasting influence on the development of the child is not easy.

It was and is obvious to me:

That fragile balance between the hydraulic pressure and the tissue pressure resulting from growth does not occur as a coincidence. Main goal of the treatment should be to acquire conditions as close as possible to those known from a healthy child. I am convinced that gravitation valves provide an important contribution in reaching this goal. Even if no proof has been provided so far in any prospective randomized study, there is a large amount of clinical data, which confirms the theoretical basis. The development of the paediGAV® would never have been possible without the dedicated support of many neuro and pediatric surgeons. The open discussion of clinical successes and failures, criticism and encouragement and the willingness to take on new ideas are the basis for the chance of progress and improvement. I am thankful for the advice and assistance in bridging the border between technology and clinical practice.

Christoph Miethke
President and Head of Research & Development

Christoph Miethke studied medical technology at the Technical University (TU) in Berlin. Early in his studies, while working in a medical technology company, Christoph discovered problems with the valve systems used for treating Hydrocephalus and developed his first ideas for improving them. After successful completion of his studies, Christoph was fueled by his ambition for research, and with the added encouragement of his TU professor, Klaus Affeld, he decided to found his own company.

Christoph Miethke, May 2008,
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