

THE HISTORY OF PAEDIATRIC NEUROSURGERY AT MEDICAL FACULTY OF CHARLES UNIVERSITY IN HRADEC KRÁLOVÉ



J. Pařízek, M.D. (1931)

Jan Pařízek

Dedicated to Professor Rudolf Petr, founder of the Department of Neurosurgery in Hradec Králové on the occasion of his 88th birthday.

Introduction

The foundation of modern paediatric neurosurgery is credited to F.D.Ingraham who established the first neurosurgical unit for children in Boston in 1929. The prevailing contents of this surgical branch was represented by tumours, inborn defects of spinal cord and hydrocephalus. Experience with the paediatric neurosurgical problems led to the publication of the first paediatric neurosurgical textbook by Ingraham and Matson in 1954. In the fifties a general expansion of paediatric neurosurgery appeared both in Europe and in the U.S.A. Independent and specialized departments of paediatric neurosurgery were gradually coming into existence. In our hospital such a ward was established as a part of Department of Neurosurgery in the year 1971; in University Paediatric Hospital in Praha - Motol it was founded 8 years later, in the year 1979.

Development that led to the separation of paediatric neurosurgery is characterized by certain specific features. The patient of paediatric neurosurgery is an object with special anatomical, physiological and evolutionary qualities. Both the investigation and operation approaches demand specific methodology in individual children age periods. The same also goes for special instruments, operation table adjustment, specific anaesthesiological approaches, different policy in compensating blood losses, water and minerals management etc. (7).

Other problems come from specific spectrum of diagnoses in paediatric neurosurgery. Specialist who concerns with this branch of surgery is able to gain rather profound diagnostic and therapeutic experience. But what is even more important, due to the nature of his work he has, and is able, to get into the problems of children organism reactivity in neurosurgery, to gain knowledge, clinical feeling and personal approach to children patients, to their tolerance of the surgical performances, to the postoperative care, problems of X-ray contrast investigation methods, and so on (7).

Paediatric neurosurgical sphere of activity includes also that of other specialists as paediatric neurologist, radiologist,

anesthesiologist, paediatrician, endocrinologist, oncologist, pathologist - many different specialists of medical and technical branches. Neither the cooperation with psychologist should be omitted and also the work of paediatric nurses, educated to treat the paediatric neurosurgical patients, ought to be pointed out, as well as this of rehabilitation and educational workers in the hospital (7,24).

Author contemplated the development of paediatric neurosurgery within individual periods since its beginning in Hradec Králové till present times. Due to the high number of publications and papers of local authors concerning radiological, neurological and neurosurgical problems (from the field of diagnostics, treatment and research) there are mentioned only some papers of utter importance and those concerning with paediatric neurosurgical operations.

The history of the Department of Neurosurgery in Hradec Králové is unequivocally connected with names of Academician Jan Bedrna, Head of the Surgery (1934 - till his sudden death in 1956), and his disciple Academician Rudolf Petr, Head of the Neurosurgery (1948 - till 1986, when the department was taken over first by Professor Rudolf Malec, M.D., PhD., and in the year 1994 by Associated Professor Jiří Náhlovský, M.D., PhD.)

Period 1948 - 1971 (-1986) Professor Rudolf Petr, M.D.

Born on 29th July, 1912, graduated in 1936 on the Medical Faculty of Charles University in Prague. After a short engagement in Havlíčkův Brod he started working in the Department of Surgery in Hradec Králové as an assistant to by then Assoc. Professor Bedrna. Since 1947 already Professor Bedrna, as one of few Czech surgeons, as soon as in the forties fully understood the importance of specialization and that was why he enabled development of practically all the specialized branches. He personally started a pioneer work in cardiosurgery. Bedrna's understanding for all the new led to assistant Petr's stay in the U.S.A. There, by professors E.Sachs, P.Bailey, H.Schwartz and ot-

hers, within the time span of years 1946- 1948, he mastered basics of modern neurosurgery, based on specific diagnostics and closely connected with pathophysiology. **After one and a half years of stay in the U.S.A., as soon as in the year 1948, he started fully paying his professional attention to neurosurgery within the Department of Surgery.** In the year 1949 assistant Petr was habilitated as the first new Associate Professor in Hradec Králové. In the same year a separate neurosurgical ward with 8 beds was established within the Department of Surgery. After Department of Surgery having been completed in 1951 there has also appeared Department of Neurosurgery with 30 beds. Between the years 1952 - 1958 it became a part of Military Medical Academy, into which for a certain period the Medical Faculty had been transformed. Based on this department existence **the first University Neurosurgical Department in Czechoslovakia derived its statutory origin in the year 1952.** The wards were filled up surprisingly soon so that extra beds had to be used and number of patients often grew to 40 or more. Establishment of the 8 beds post-operative unit, the first one in the whole hospital, was of quite an outstanding importance for operation results. Also a neurohistopathological laboratory as a part of the department was founded. From the very beginning it performed operation biopsies and tumours classification (Dr. A.Fantiš, since 1962 till now Professor S.Němeček, M.D., DrSc.). EEG laboratory was headed by Ass. Prof. Z.Menšíková, PhD.).

Being the Head of Department Professor Petr was interested in all the fields of Neurosurgery. **Since the very beginning he considered the children patients as those demanding special care.** Nevertheless, by that time children had to be admitted in the adult wards, without adequate regimen. In terms of by then topical problems - the hydrocephalus treatment - in the year 1949 assistant Petr demonstrated on the VIth Conference of Czechoslovak Surgical Society in Prague a unique drainage operation for communicating hydrocephalus. The principle of this operation consisted in fenestration of anterior wall of dural sac in sacral region, which was first performed in two adults and subsequently also in two children (30). **Nevertheless, even on the separate department after the year 1951 an insufficient wards capacity enabled to reserve only one small four-bed room for children.** There were admitted neither necessary numbers of children patients, nor for sufficiently long a time (e.g. injuries, meningocele, tumours for irradiation, hydrocephali for follow-ups, other children for check-ups etc.) (7,24). In spite of this numbers of children permanently grew, so that in the year 1952 100 of them were admitted and 50 operated on (24). The ward-rounds in the children room were done first by surgeons without special orientation (Dr. M.Kroó, Dr. R.Malec, Dr. P.Nádvorník), starting from the year 1960 by neurological medical superintendent Dr. V.Rozsival. In publications from that time assessment of the adult population according to diagnoses prevailed. In some sets the children were not present. Altogether 6 papers only dealt with paediatric problems (1-5,31). Due to

the above mentioned facts Professor Petr planned a separate paediatric ward in his concept of a new neurosurgical department.

A new building of Neurosurgical Department, with a top contemporary equipment, had 95 beds and was opened in the year 1971. It also contained a separate paediatric neurosurgical ward, the first and the only one in Czechoslovakia. The Neurosurgical Department was complemented with the Institute of experimental neurosurgery, consisting of neurobiochemical laboratory (Dr. J.Cerman), neurophysiological laboratory (ass. prof. V.Golda, M.D., PhD.), neuropathological laboratory (Dr. S.Němeček, PhD.), and operation tract for small animals operations. After 3 years lasting cooperations with ass. prof. Z. Menšíková, the EEG laboratory was finally taken over by MUDr. J.Němečková, medical superintendent for EEG. Ass. prof. Z.Černoch, PhD. and MUDr. M.Šercl, PhD. from Radiological Department became exclusively engaged in neuroradiology. Thanks to the help of Professor Petr the Radiological Department in Hradec Králové also acquired the first CT in Czechoslovakia in the year 1978. The microneurosurgery was being gradually developed and also the laser became part of the equipment of this department. To facilitate an operation approach and possibilities of physiological operating urea, manitol, hyperventilation, perioperative lumbar puncture or external lumbar CSF drainage with a regulated flow were used.

Professor Petr's idea to concentrate diagnostics, operations, as well as the laboratories under one roof was especially appreciated in children patients. Such an organization undoubtedly advanced the work standards, which became a subject of admiration (and maybe also of envy?) of even foremost foreign professionals visiting our department. During the years Professor Petr was interested within the field of paediatric neurosurgery mainly in vascular malformations, cerebral and brain stem tumours (17), vascular and tumorous processes in the orbit (18), operations of spinal cord tumours using the laser etc. He further participated by his advice, he indicated or approved of therapeutical approaches and operated some children till as late as 1986 when he passed the Department to Ass. Prof. R.Malec, PhD.

In this article we are concerned with the history of paediatric neurosurgery solely - history of the whole Department of Neurosurgery will be dealt with by Assoc. Professor Náhlovský, PhD. - so we would like only to briefly remind Professor Petr's achievements in other fields of neurosurgery. As soon as by the end of the forties Professor Petr started with operating intracranial vessel lesions - **aneurysms and arteriovenous malformations** (Petr, Malec, Kroó: Surgical treatment of intracranial aneurysms [in Czech]. Sb prací VLA 1952;3:1-25; Petr, Kroó: Possibilities and prospects of operation treatment of cerebral vascular malformations [in Czech]. Sb prací VLA 1954;8:134-143). He was also interested in **surgical treatment of brain abscesses** [in Czech]. (Čas Lék čes 1947;86:1299-1302), **neurotraumatology** (Petr: Proposal to unified doctrine in head, spinal cord and peripheral nerves injuries. MNO 1954 [in Czech];

Petr, Čermák: War injuries of the skull, brain, spine and spinal cord. In: *Válečná chirurgie, Naše vojsko*, Praha 1966;164-190), **cerebral supratentorial tumours** (Petr, Kroó, Malec et al: Results of the treatment of gliomas of the cerebral hemispheres [in Czech]. *Sb věd prací LF UK Hradec Králové* 1965; 8/1:139-148), and also on **posterior cranial fossa** (Petr, Kroó, Nádvořník: Surgery of tumours of posterior cranial fossa [in Czech]. *Sb věd prací LF UK Hradec Králové* 1959;2/5: 693-702), in **the tentorial incisure** (Petr, Piřha, Malec: About some tentorial incisures tumours [in Czech]. *Sb prací VII sjezdu Čsl. chir. spol. J.E.P.* 1952;494-502, Nakl. Slov akad vied a umenia, Bratislava), **the VIIIth nerve neurinomas** (Petr, Nádvořník: Results of radical extirpation of acoustic neurinoma [in Czech]. *Čsl Neurol* 1966;29:301-304), **brain stem expansions** (Petr, Kroó, Malec: A contribution to the problem of surgery of certain variations of spongioblastoma of the brain stem [in Czech]. *Čs Neurol* 1964;27/6:384-388). Priority paper concerned with **Treatment of resistant migraine by selective denervation of the dura** [in Czech] *Čas Lék čes* 1958;97: 139-143). He was also interested in neuroendocrinology - **hypophysis surgery, including the stereotactic approach** (Petr, Pínsker, Nádvořník, Dvořák: Partial stereotactic radiation hypophysectomy in the central form of Cushing's syndrome - Results [in Czech]. *Sb věd prací LF UK Hradec Králové* 1964;7:253-260; Petr, Nádvořník, Rameš, Černošch:

Some surgical problems of radiation hypophysectomy by stereotactic operations [in Czech]. *Lék zprávy LF UK Hradec Králové* 1960;5:109-117; Petr: Surgical close of the liquorrheal fistula of iatrogenic origin in the area of the sella turcica [in Czech]. *Rozhl Chir* 1966;45:731-734). He was also performing **the spinal cord transposition as a radical treatment of kyphoscoliosis** (Petr: Operative treatment of paraplegia in kyphoscoliosis [in Czech]. *Čsl Neurol* 1966;29:326-330).

Professor Petr was also the co-founder of Czechoslovak Neurosurgical Society and was awarded quite a few Czechoslovak and foreign honorary acknowledgements and high distinctions.

On the occasion of 50th anniversary of Medical Faculty of Charles University in Hradec Králové in the year 1995 Professor Petr stated that „The Department has retained a fully qualified staff of highly educated and specialized neurosurgeons. In spite of the span of 50 years which had passed since its origin the Department kept the professional continuity even under the following Head of Department Professor Rudolf Malec, M.D., PhD. and later on also of Ass. Prof. Jiří Náhlovský, M.D., PhD.“ (Team of authors: *Medical Faculty of Charles University in Hradec Králové 1945-1995*. Publisher ATD 1995).

Period 1971 - 1998 Jan Pařízek, M.D.

Born on January the 17th, 1931, graduated in 1956 on the Medical Faculty of Charles University in Prague. Within the framework of Ministry of Health to help Slovak regions he was allocated in Partizánske in the region Nitra where he had been working as a houseman for one year in the surgical department, for half a year in the otorhinolaryngological department and then 2 years as a houseman and deputy chief in the orthopaedical and traumatological department. After the advertisement of a post in the Department of Surgery in 1959 he started working in the department of Professor Procházka in Hradec Králové. He held a post of a houseman and after the first degree specialization in 1960 he passed as a special assistant to the Department of Neurosurgery. From these times there originates a publication with orthopaedical theme (Pařízek: *Die Einheilung knöcherner Heterotransplantate bei 100 Fällen von Wirbersäulenversteifung nach Halstead-Šamov*. In: *Kettler-Serfling: Gewebekonserven*, Bd.II., VEG Verlag Volk and Gesundheit, Berlin, 1965). As a junior doctor he was assigned for educational purposes to MUDr. Pavel Nádvořník in an out-patient department and on consultation duties on the paediatric department. In the year 1971 he passed the second degree specialization from neurosurgery and in a newly opened separate Neurosurgical Department was appointed by Professor Petr in charge of paediatric neurosurgical ward. At the beginning he worked in this ward alone, in the year 1977 MUDr. Jana Němečková started working here as a neurologist with the second degree



Fig. 1: Professor Rudolf Petr, M.D., born 1912, Head of the Department of Neurosurgery and Chief of the Institute of experimental neurosurgery in Hradec Králové. On the picture also (from left): Jan Pařízek, M.D., medical superintendent of the Ward of paediatric neurosurgery and qualified paediatric nurse Blanka Dolanová. Copy ČTK 1984.

neurologist specialization. This separate ward, the first one in the whole republic, had 15 beds with rooms for bigger children, toddlers, sucklings and newborns, as well as the intensive care unit. Children after serious neurosurgical operations and injuries were temporarily treated on the central postoperative and intensive care unit in the vicinity of operation theatres. On the recommendation of Professor Petr but particularly thanks to the region hospital director MUDr. Svatava Lakosilová and after the approval of Ministry of Health the ordinariate of paediatric neurosurgery by Department of Neurosurgery was established in the year 1979. In 1980 MUDr. Jan Pařízek, until now the head of this part of the department, after 20 years of assistancy became the medical superintendant for paediatric neurosurgery.

Diagnosics

Using of the pneumoencephalography, ventriculography, cisternography and gamagraphy was culminating by that time. Electroencephalography (18), angiography and also native X-ray retained their importance up to now. The same also goes for neurological and opthalmological clinical investigations.

A marked progress in diagnostics was gained within the decade 1972 - 1982 by introducing ultrasound, computerized tomographic (CT) and magnetic resonance investigations (MRI). Introduction of CT in our hospital in 1978 generally led to an improvement in prognoses of operated patients and to a marked decrease of postoperative mortality (12,17,18). From 32 papers mentioned as references to this article in 21 of them the macrodiagnosis was set by the help of CT (6,9,10-21,23-29). In the period of time given above also the digital subtraction angiography and intervention neuroradiology - balloonization and embolization - were developed. Endovascular embolization therapy, thanks to the introduction of microcatheters in 1988, enabled the selective angiography of separate tributaries of cerebral vascular malformations in order to embolize the active centre of this malformation, so called nid (Krajina, Hlava: Angiography [in Czech], Nucleus HK, 1999). Addendum: Černoch et al (Eliáš, Krajina, Ryška, Šercl, Žižka) published recently the book: Neuroradiology [in Czech], Nucleus HK, 2000.

At the beginnings the puncture biopsy used to be performed from free-hand, in the year 1990 **the stereotactical biopsy** was introduced. In 1995 Hobza, Jakubec, Němečková, Němeček, Šercl published a work: Impedance monitoring in the stereotactic localization of intracranial structures (Sbor věd prací LF UK Hradec Králové 1995;38/1: 33-46), in which they found the intraoperative continuous monitoring of tissue impedance to be a safe and very beneficial auxiliary method in the stereotactic localization of normal and pathological intracranial structures. On the 11th International Congress of Neurological Surgery, Amsterdam, July the 6th-11th, 1997, these authors presented results of the continuous bipolar impedance monitoring during various CT-guided stereotactic procedures (needle and open stereotaxy, endoscopy, lasersurgery, bra-

chytherapy, drainage, medicament instillation) in more than 90 patients with brain pathologies within the years 1993-1996. Clin Neurol Neurosurg 1997,99 (Suppl 1): S 162 (Abstracts).

Operations

Thanks to the diagnostic process improvement the osteoplastic craniotomies were being performed aimed on the pathological focus. Local anaesthesia was employed at the beginning, later on ether was used. Nevertheless, most children were operated under the endotracheal anaesthesia. The technical development has also helped to introduce operation microscope and laser (Malec, Látr, Náhlovský, Němeček: Our experience with 400 neurosurgical laser operations [in Czech]. Čes a Slov Neurol Neurochir 1996; 59/92:261-264). Also the ultrasound aspirator, high-frequency drill, peroperative electrophysiological monitoring, stereodendoscopy, endovascular procedures using digital subtraction angiography, gamma-knife irradiation etc. started being introduced. Modern anaesthesiology, as well as improvement in operation technique and postoperative care, brought markedly better operation results (18).

Within the span of years 1948 - 1999 altogether 7092 children were admitted and 3286 children operated in the Department of Neurosurgery. Qualified paediatric nurse Iva Košťálová participated in statistical processing of these data. In the sets of 5 years (7), 10 years (24), 28 years (tab.1) and 50 years (17,18) intervals there dominated tumours of the skull, brain and orbit, the second and third places being occupied by hydrocephalus operations and craniocerebral injuries. Set of children under the age of 18 years according to diagnoses within the years 1971 - 1999 is shown in Tab 1.

Tab. 1: Set of children aged under 18 years in the independent ward of paediatric neurosurgery according to diagnoses (October the 1st, 1971 - December the 31st, 1999).

Hospitalization	%	Diagnosis	Surgery*	%
1005	19,6	Tumours: calvar, brain, orbital	730	31,0
631	12,3	Hydrocephalus: various types	402	17,1
1687	32,9	Craniocerebral trauma	340	14,4
259	5,1	Haematomas: epi-subdural, intracerebral	161	6,8
173	3,4	Peripheral nerves	155	6,6
159	3,1	Meningocele: various locations	118	5,0
194	3,8	Vascular lesions	97	4,1
116	2,3	Spinal tumours	91	3,9
70	1,3	Craniostenosis	47	2,0
82	1,6	Infection intracranial	41	1,7
45	0,9	Discus hernia	27	1,1
80	1,6	Spinal trauma	17	0,7
619	12,1	Various	131	5,6
5120	100,0	Total	2357	100,0

* Table is arranged according to the number of operations

1) Tumours. Group of **supratentorial cerebral tumours** in children surgically treated within 50 years (1948-1997) consisted of 363 operated and 42 reoperated children. Dr. Pařízek took part in 48,6%, Professor Petr in 22,5% and 11 other doctors in 28,9% of these operations (18). Low-grade brain glial neoplasms used to be often associated with epilepsy. Němečková, Němeček, Náhlovský, Pařízek and Šercl came to the important conclusion that histological and immunohistochemical analyses of resected tissue suggest that the peripheral zone of cortical tumour may participate on epileptogenesis (Sbor věd prací LF UK Hradec Králové 1995;38/4: 175-183). **Infratentorial processes** within the same period of time represented the subject of operations in 471 children (406 tumours, remaining predominantly aqueduct stenoses and arachnoidal cysts). Pařízek participated in these operations in 48%, Professor Petr in 24,8%, remaining 11 surgeons in 27,2% (17). The supratentorial to infratentorial tumours rate in children of this set reached 47 : 53% [363 : 406] (17,18). **Spinal tumours** were found in 3,9% of operated children (Tab. 1). 16 children operated on within the years 1950 - 1961 were assessed by Rozsival, Pařízek and Lichý (31). 92 patients, including children, treated during the twenty years span (1976 - 1996) for **intramedullary spinal cord tumours** were almost equally distributed among astrocytomas, ependymomas and other types of tumours. Intramedullary located tumours form a distinct pathological entity that is nowadays better diagnosed with the help of MRI. CO₂ laser and CUSA enable today more radical removal of these tumours. (Náhlovský, Malec, Látr, Kaltofen, Šercl: Long-term results in intramedullary spinal cord tumours treatment. Abstracts of the 11th International Congress of Neurological Surgery, Amsterdam, 6-11 July 1997). Clin Neurol Neurosurg 1997;99 (Suppl 1):S 204.

Histological standardization of tumours used to be initially performed in the neuropathological laboratory of Department of Neurosurgery according to Zülch's scheme. Since the year 1980 there is being used the WHO classification, which was modified at the beginnings of the nineties (Němeček, Tauš, Němečková: Advances in classification of central nervous system tumours [in Czech]. Čes a Slov Neurol Neurochir 1996;59/92: 296-303). During the years 1993-1996 Professor Němeček et al worked on the grant „Nosological units in neurosurgery (the complex histological classification of cerebral tumours)“. Papers concerning the brain tumours operated in children within the 50 years time interval originated also from the collaboration on this work (17, 18).

2) Drainage operations. These types of operations stabilized the cerebro-spinal fluid circulation. Quite often they represented the only treatment possibility, even in those cases where tumour had not been verified microscopically (18). From all the number of drainage operations for primary hydrocephalus of different aetiology the whole spectrum of procedures were tried: **Torkildsen's ventriculo-cisternostomy (usually unilateral), Petr's anterior dural sacral fenestration,** rather rare Heile's dural-ureterostomy after nephrectomy, Bakulev-Burděnko's omentopexis, Nosik's ventriculo-mastoidostomy, Dandy's coagulation or extirpation of chorioidal plexus in lateral brain ventricles, transdural drainage of cerebro-spinal fluid into the spongy lumbar vertebra body (Ziemnovicz), fenestration in the region of foramen Magendi, IIIrd ventriculostomia anterior (Stookey-Scarff), IIIrd ventriculostomia posterior (Dandy), and ventriculo-ureterostomy after the nephrectomy (Matson) that was modified by Professor Petr's implantation of Spitz-Holter valve inside the catheter. Since the year 1960 the **ventriculoatrial drainage** has been performed (Spitz-Holter valve), and since 1979 **ventriculoperitoneal drainage** (Spitz-Holter valve) or its modification - cystoperitoneal or lumboperitoneal drainage (H-V Cordis valve). Most of the above mentioned drainage operations ceased being used in the course of years, with the exception of **Torkildsen's and ventriculoperitoneal or ventriculoatrial shunt drainages with different types of valves, including those capable of being programmed.** Only from time to time there are being performed following drainage operations: **(1) Retrograde catheterization of aqueduct,** in which in the year 1978 Professor Petr introduced the silicon catheter with lateral openings (Codman, Cordis); **(2) Fox's drainage with Ommaya reservoir** - in cystic craniopharyngeoma introduced in the year 1978 by Dr. Pařízek during the direct tumour revision (14), since the year 1994 performed by dr Jakubec in the stereotactic way; **(3) External lumbar CSF drainage with a regulated flow** - in the year 1990 introduced by Dr. Pařízek (Pařízek, Němečková, Měřička, Eliáš, Šercl, Lichý: External lumbar CSF drainage with a regulated flow - its application in child neurosurgery [in Czech]. Čas Lék čes 1990;129/36:1138-1140); and **(4) Stereofenestration of the IIIrd ventricle basis by the neuroendoscopical approach** - since 1992 done by Dr. Jakubec and Dr. Hobza.

3) Injuries. Brain traumas represented 32,9% and spinal cord injuries 1,6% of admitted children (Tab 1). Generally, there prevailed brain concussions, in operated children there were **different types of penetrating cerebral injuries, impressive fractures of skull, epidural, subdural and intracerebral haematomas** (Malec, Matějčec: A contribution to the treatment of post-traumatical epidural haematoma [in Czech]. Rozhl Chir 1967;46/11: 738-744; Kuldová, Kroó: Epidural haematoma above the posterior cranial fossa. Sb věd prací LF UK HK 1973;16/4-5:309-314; Pařízek, Zemánková, Malec: Puncture of the subdural space through the anterior fontanel [in Czech]. Čs Pediatri 1982;37:138-143), and then **foreign bodies injuries** (Nádvorník, Zoubek, Rozsival: Unusual trauma in a child's head with a knife [in Czech]. Lék zprávy 1968;13:69-72; Malec, Černochoch, Řezáč, Náhlovský, Pařízek: Cerebral injuries penetrating via the orbit. Importance of graphic examinations [in Czech]. Čas Lék čes 1983;122/11:323-326), etc.

4) Other operations. Different, less frequent performances done in the paediatric neurosurgical ward within the years 1971-1999 are shown in Tab 1.

Collaboration with the Tissue Bank Hradec Králové

From the very beginning of the existence of Tissue Bank, founded in 1952 by MUDr. Rudolf Klen, there existed a close cooperation with this institution. As soon as in the year 1956 allogenic fascia lata and dura mater, as well as xenogenic dura mater were used for dural plastic reconstruction (Kroó, Klen: Our experience with dura mater substitution by freeze-dried fascial and dural grafts [in Czech]. *Lék zpr LF UK HK* 1960;5:80-85; Klen, Metelka, Pařízek: Freeze-dried homogenous grafts of fascia lata in neurosurgery. *J Neurosurg Sci* 1977;21/4:247-250; Pařízek: Fascial grafts in pediatric neurosurgery. *Sb věd prací LF UK HK* 1978;21/4:437-441). The use of both the xenogenic and allogenic dural grafts was soon abandoned and for a long time only fascial grafts were preferred. **Originally there were mainly used fascial grafts decontaminated by the cold shock (Klen: Cold shock. *Folia Biol* 1959;1/V:82-83) and conserved by freezing on the temperature -20, later on even -50 degrees centigrade.** Since the year 1967 the fascial grafts were freeze-dried and since 1975 their freeze-drying was supplemented with sterilization by gamma irradiation in the dose of 25 kGy. Nevertheless, the negative influence of irradiation to the grafts mechanical properties, such as their tearing into filaments by suturing, has been discovered. **Thanks to the fact that in children the soft skull coverings are thin, the dura plastic operations, especially on the posterior cranial fossa, are well-founded.** Thus we felt a need for sufficient supply of in advance prepared tissues so that no autogenous fascia lata needed being taken. **Therefore, since 1986 (under MUDr. Měříčka's heading of the Tissue Bank since 1984) the fascia grafts decontaminated by cold shock and preserved by deep freezing (-50 till -70 degrees centigrade) started being used again.** Also the conclusions of some works have been gradually introduced into the clinical practice: Pařízek, Měříčka, Špaček, Hušek, Straková: Plastic operations of the dura mater - Physical properties of some materials in experiments [in Czech]. *Čs Neurol Neurochir* 1987;50/83:73-82, and Pařízek, Měříčka, Špaček et al: The importance of dura plasty and securing liquor circulation after operation on posterior cranial fossa in children [in Czech]. *Čs Neurol Neurochir* 1987;50/83:370-379. Starting from the year 1986 a new technology of tissue lyophilization has been introduced, allowing wrapping up the grafts into the disposable plastic covers. This technology enabled using again also the allogenic dural grafts (Měříčka: A specially pretreated freeze-dried dura mater - a perspective material for duraplasty [in Czech]. *Lék zpr LF UK HK* 1991;36:49-59). Besides the sterilization by gamma irradiation also the ethylenoxide sterilization of lyophilized grafts was mastered. **But the Tissue Bank became gradually unable to meet demands of all the surgical and neurosurgical departments in all the former Czechoslovak republic as went for the allogenic fascial and dural grafts. That was why in the**

year 1983 the bovine lyophilized pericardium, stabilized by glutaraldehyde and sterilized by gamma irradiation, was introduced (Měříčka, Hušek, Straková et al: Vorbereitung und klinische Anwendung von xenogenen, durch Glutaraldehyd fixierten, lyophilisierten Pericardium Transplantaten. *Probl Hämatol Transf Transpl* 1986;7:345-355; Pařízek, Měříčka, Špaček et al: Plastic operation of the dura mater in children, using xenogenic pericardium [in Czech]. *Čas Lék čes.* 1989;128/22:682-684; see publication in *J Neurosurg*). **The technology of its production was gradually improved so that the search for thinner and more supple material went on to the suggestions of Hušek from the Tissue Bank to use ovine pericardium (1991)** (see publication in *J Neurosurg*). Many practical conclusions came from the research work „Using the collagen tissues (xenogenic pericardium, allogenic dura mater and fascia lata) for dural plastic in neurosurgery“, which had been accomplished by Pařízek, Měříčka et al within the years 1986-1990. **For reconstruction of dura mater and of the orbit ceiling the autogenic, allogenic and xenogenic tissue grafts were successfully used (8,9,11-13,15,17,18,21,27,28).** Works concerning dural plastics have been repeatedly awarded the prizes of Czechoslovak Neurosurgical Society. Addendum: Brief history of the tissue bank, Charles University Hospital, Hradec Králové, Czech Republic by Měříčka has been published recently in *Cell and Tissue Banking* 2000;1:17-25. 2000 Kluwer Academic Publishers. Printed in the Netherlands.

To summarize it can be stated that within the years the author concentrated his professional paediatric neurosurgical activity on the field of surgery of brain and spinal cord tumours (13,17,18,20-22,27,31), operations of orbit (22), specific situations and complications of drainage operations (6,14,23,25,26), and also for a number of years (1960-1997) in cooperation with Tissue Bank in Hradec Králové (Professor Klen, Dr. Měříčka, Dr. Hušek) on improvement of collagen tissues used for dural plastics, quite often performed in children especially. In histological processing of tissue grafts there cooperated Professor Němeček and Professor Špaček (8,9,11,12,15,28).

Membership in professional medical associations and publication activity

Besides the home medical associations (Czech Medical Society of J.E.Purkyně, Czechoslovak Neurosurgical Society, Association of Czech Medical Doctors in Hradec Králové and Medical Chamber) within the years 1984-1997 the author was a member of **European Society for Paediatric Neurosurgery (ESPN)** that was founded in the year 1967. Since the year 1975 *Child's Brain* and since 1985 *Child's Nervous System* were the official journals of this Society. Together with radiologists and neuropathologists we published in this journal 9 papers (6,12,13,16,21,25,26,28,29). Two other papers were published in *Journal of Neurosurgery* (Pařízek, Měříčka, Špaček, Němeček, Eliáš, Šercl:

Xenogenic pericardium as a dural substitute in reconstruction of suboccipital dura mater in children. 1989;70:905-909; Pařízek, Hušek, Měříčka et al: Ovine pericardium: a new material for duraplasty. 1996;84:508-513. This material was used for the first time at all within the whole world). In **Neuropediatrics** there was published the paper concerning the melanotic progonome (14). The publication in **Acta Neurochirurgica (Wien)** introduced the largest statistics of dural plastic procedures worldwide (Pařízek, Měříčka, Hušek et al: Detailed evaluation of 2959 allogeneic and xenogeneic dense connective tissue grafts (fascia lata, pericardium and dura mater) used in the course of 20 years for duraplasty in neurosurgery. 1997;139:827-838). It follows from this work that allogenic fascia lata, decontaminated by the cold shock and conserved in plastic covers by freezing, represents thanks to its plasticity an universal graft. Ovine pericardium is suitable due to its thinness, flexibility, transparency and easy cutting. In the book **Annual Review of Hydrocephalus 1990**, vol. 8: 45-46. NEURON Publishing Co., Ltd., Tokyo, Japan, there was published the work of Pařízek, Němečková, Šercl: Bobble-head doll syndrome associated with the III ventricular cyst: Three cases in children 7 years after CVP shunting. The remaining 70 papers (concerning not only with the paediatric problems) were published in Czech journals. Such a publication activity, together with the influence of the Department management, have undoubtedly participated in introducing the author in **Marquis Who's Who in the World 15th Edition 1998** (121 Chanlon Road, New Providence, NJ 07974, U.S.A.)

Period 1998 - until now Josef Jakubec, M.D., PhD.

Born on December the 12th, 1950, graduated in 1975 on the Medical Faculty of Charles University in Hradec Králové. After a short stay in the Neurological Department in Hradec Králové he started working in the Department of Neurosurgery in the year 1976. The first degree specialization he passed in 1979, the second degree - neurosurgical specialization in 1985. Within the years 1986 - 1990 he worked on the research project: „**Therapeutical use of chronic electrostimulation of the brain.**“ This theme was also the subject of his postgraduate - Candidate of science's degree work defended in 1992. Within the years 1987 - 1997 he worked as the Deputy Head for treatment and preventive activities. In the year 1996 he presented the closing communication of the grant: „**Our experience with diagnostic and therapeutic cerebral endoscopy.**“ These results were also delivered on the XIth International Congress of Neurological Surgery, Amsterdam, 6-11th July 1997. (Jakubec, Hobza, Zadrobílek, Pařízek, Náhlavský, Malec, Němečková, Šercl: Clin Neurol Neurosurg 1997, 99 (Suppl 1): S 147 (Abstracts): 51 neuroendoscopic interventions from I/1993 to X/1996 were performed in patients aged between

1 month to 68 years. The main indications were para- or intraventricular cystic tumours (23), arachnoid, ependymal or colloid cysts (10), and hydrocephalus (10). The diode laser Diomed 25 was a part of instrumentation. The reliability of histopathological diagnosis after endoscopic biopsy was 91,7% in 36 cases.

Acknowledgement

I would like to express my thanks: **to my teacher Professor R. Petr, M.D. for entrusting me with leading the independent paediatric ward of the Neurosurgical Department;** to Professor S. Němeček, M.D., DrSc. for nearly 40 years lasting cooperation and for an invitation to write this article; to Professor R. Malec, M.D., PhD., and Ass. Professor M. Kroó, PhD., the senior co-workers of Professor Petr for making accurate the historical data, as well as for the help and advice in writing this paper; **J. Němečková, M.D. who has been working as a neurologist in the paediatric ward of our Department since 1977, for perfect and exclusive cooperation;** to nurses for their devoted work; to Mr. P. Šuba, PhC. for technical help in correction of this publication and to Ass. Prof. K. Šmejkal, PhD. for translating my words into English.

References (selected papers dealing only with surgery in children).

- Gabriel J. Glioma of the pontocerebellar angle six years after operation (in Czech). Rozhl Chir 1957;36(9):605-8.
- Látr I, Pařízek J, Černoč Z, Polák J. Haemophilia discovered in the course of treatment of posttraumatic subdural haematoma. Sb Ved Pr Lek Fak Univerzity Karlovy Hradec Králové 1973;16:319-22.
- Nádvořník P, Malý Z. Giant sacrococcygeal teratoma (in Czech) Lék Zpr LF UK Hradec Králové 1962;1-2:5-8.
- Němeček S, Rozsival V. Coetaneous cerebellar teratoma (in Czech). Čs neurol 1965;28(6):458-60.
- Pařízek J, Dvořáčková I. Congenital craniopharyngioma (in Czech). Lék Zpr LF UK Hradec Králové 1962;1-2:11-4.
- Pařízek J, Jakubec J, Hobza V et al. Choroid plexus cyst of the left lateral ventricle with intermittent blockage of the foramen of Monro, and initial invagination into the III ventricle in a child. Child's Nerv Syst 1998;14:700-8.
- Pařízek J, Kroó M, Malec R, Rozsival V. Working programme of a Department of child neurosurgery (in Czech). Rozhl Chir 1979;58(6):351-4.
- Pařízek J, Lichý J, Němeček S, Černoč Z. Dandy-Walker-Syndrom; surgery in an immature infant (in Czech). Lék Zpr LF UK Hradec Králové 1980;25(1-2):5-19.
- Pařízek J, Lizler J, Šercl M, Vaňásková Z. Benign cyst of the paramedian pontine tegmentum diagnosed by magnetic resonance imaging (in Czech). Lék a Tech 1991;22(2):44-6.
- Pařízek J, Malec R, Šercl M et al. Posttraumatic haemorrhage and infarctions of the basal ganglia in children (in Czech). Čs Neurol Neurochir 1984;47(80):370-6.
- Pařízek J, Marklová E, Černoč Z et al. Tumour in pineal region with α_1 -fetoprotein and chorionic gonadotropin positive values in serum and cerebrospinal fluid (in Czech). Čs Neurol Neurochir 1983;46(79):293-300.
- Pařízek J, Měříčka P, Němeček S et al. Allogeneic cartilage used for skull base plasty in children with primary intranasal encephalomeningocele associated with cerebrospinal fluid rhinorrhea. Child's Nerv Syst 1996;12:136-41.
- Pařízek J, Měříčka P, Němeček S et al. Posterior cranial fossa surgery in 454 children. Comparison of results obtained in pre-CT and CT era and after various types of management of dura mater, Child's Nerv Syst 1998;14:426-39.
- Pařízek J, Náhlavský J, Heger L, Šercl M, Blaha V. Fox's drainage with reservoir in cystic craniopharyngeoma (in Czech). Čs Neurol Neurochir 1980;6:383-7.
- Pařízek J, Němeček S, Černoč Z, Heger L, Nožička Z, Špaček J. Melanotic neuroectodermal neurocranial tumor of infancy of extra- intra- and subdural right temporal location. Neuropediatrics 1986;17(3):115-23.

16. Pařízek J, Němeček S, Němečková J, Černoš Z, Šercl M. Congenital dermoid cysts over the anterior fontanel. Report on 13 cases in Czechoslovak children. *Child's Nerv Syst* 1989;5:234-7.
17. Pařízek J, Němeček S, Němečková J et al. Evaluation of results obtained in 458 children with operations in the posterior cranial fossa in the course of 50 years (1948-1997) (in Czech). *Čes Slov Neurol Neurochir* 1999;62(95):17-28.
18. Pařízek J, Němeček S, Němečková J et al. Evaluation of results obtained in 363 children with operations for intracranial supratentorial tumours in the course of 50 years (1948-1997) (in Czech). *Acta Med (Hradec Králové) Suppl.* 2000;43:13-27.
19. Pařízek J, Němeček S, Petr R, Šercl M, Němečková J, Špaček J. Primary neuronal brain tumours in children (in Czech). *Čs Neurol Neurochir* 1985;48(81):95-103.
20. Pařízek J, Němeček S, Petr R, Šercl M, Němečková J. Neurocristopathy in paediatric neurosurgery (in Czech). *Cas Lek Cesk* 1985;124(9):270-1.
21. Pařízek J, Němeček S, Špaček J et al. Benign cyst of the paramedian pontine tegmentum. *Child's Nerv Syst* 1991;7:347-52.
22. Pařízek J, Němeček S, Vávrová I. Two gliomas in a child of four (in Czech). *Čs Neurol* 1963;XXVI(5):301-3.
23. Pařízek J, Němečková J, Černoš Z, Šercl M, Heger L. The bobble-head doll syndrome associated with 3rd ventricular cyst (in Czech). *Cas Lek Cesk* 1983;122(4):112-5.
24. Pařízek J, Němečková J, Náhlovský J, Černoš Z. Work of Department of paediatric neurosurgery (in Czech). *Suppl Sb Ved Pr Lek Fak Univerzity Karlovy Hradec Králové* 1982;25(5):477-82.
25. Pařízek J, Němečková J, Šercl M. Bobble-head doll syndrome associated with the III ventricular cyst. Three cases of children 7 years after CVP or CVA shunting. *Child's Nerv Syst* 1989;5:241-5.
26. Pařízek J, Nytra T, Zemánková M et al. Catheterobronchial fistula due to vena cava superior thrombosis as a late complication of ventriculoatrial shunt. *Child's Nerv Syst* 1994;10:468-71.
27. Pařízek J, Šercl M, Eliáš P et al. Developmental cysts in the area of the laminae quadrigeminae in children (in Czech). *Čs Neurol Neurochir* 1988;52(85):212-7.
28. Pařízek J, Šercl M, Michl A et al. Posterior fossa duraplasty in children: remarks on surgery and clinical and CT follow-up. *Child's Nerv Syst* 1994;10:444-9.
29. Pařízek J, Šercl M, Němeček S et al. Mature sacrococcygeal teratoma containing the lower half of a human body. *Child's Nerv Syst* 1992;8:108-10.
30. Petr R. Drainage operation in an acquired communicating internal hydrocephalus (in Czech). *Sborník prací VI. sjezdu Čsl. chirurg. spol. v Praze 1.-3.VII.1949.* Praha: Zdrav nakl 1950:351-62.
31. Rozsival V, Pařízek J, Lichý J. Remarks on some questions of tumours of the spinal cord in children (in Czech). *Suppl Sb Ved Pr Lek Fak Univerzity Karlovy Hradec Králové* 1963;6(5):647-51.
32. Taláb R, Pařízek J, Šercl M, Reháček S. Spinal arachnoid cysts (in Czech). *Čs Neurol Neurochir* 1985;48(81):261-3.

***MUDr. Jan Pařízek,
University Teaching Hospital,
Department of Neurosurgery,
500 05 Hradec Králové,
Czech Republic.***