Jean-Félix DUBOUSSET (1936, Clermont-Ferrand – 2025, Paris, France)

EPOS Pro Maximis Meritis 2004

Jean Dubousset grew up in Auvergne, centre of France, where he started his medical school in the 50's, and moved to Paris at the end of the decade as resident. He wanted to become a paediatric orthopaedic surgeon. He was nominated Professor in 1991. During all his career, he worked at the Saint Vincent de Paul Hospital in Paris. He was a curious and meticulous observer; he never stopped working. He loved to repeat: "*your patients are your teachers"*. France recognized his exceptional contributions by naming him *Chevalier de la Légion d'Honneur*. When he turned 50, he spend a sabbatical year in Miami (Harry Shuffelbarger) and at the TSRH Dallas with Tony Herring, Charles Johnston, Steve Richards, John Birch.
[Zeller RD. In memoriam : Professor Jean Dubousset (1936-2025). J Child Orthop. 2025; 19: 251-2].

EPOS recognition

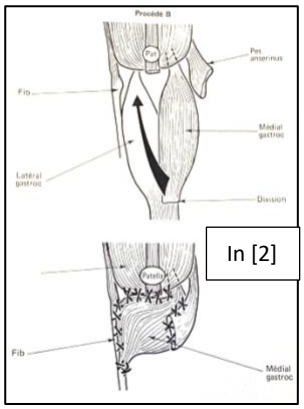
During the 23rd annual meeting in Geneva, 2004 (local host: André Kaelin), Professor Grill explained to the general assembly the establishment of an EPOS Honorary Medal "*Pro Maximis Meritis*", which will be awarded to recognize relevant contribution to Paediatric Orthopaedics surgery. He proposed to award Mr. Jean Dubousset and Mr. John Fixsen for the award, candidacy that the general assembly agreed on unanimously.

Almost any EPOS paediatric spine surgeon visited Jean Dubousset at Hospital St Vincent de Paul, Paris for some days, weeks or months. All of them found a great humanist who had excellent relationships with his patients and their family, a great skill surgeon who never hesitated to treat the more complex cases, a brilliant memory which never forgot any case, a hard worker who never stop outpatient clinic, operating room, meetings or teaching residents and visitors, and who travelled around the world for giving lectures.

Contribution to Paediatric Orthopaedics

His prodigious scientific activity was guided by: "*Observation is the basis and always doubt about what you have already learned*" loved to teach Dubousset. Among more than 233 publications (PubMed), around 45 are dedicated to almost all topics of Paediatric Orthopaedics including traumatology. His favourite topics were complex and neuro-muscular diseases like Duchenne's, spinal amyotrophy, obstetrical palsy, cerebral palsy.

Among these disorders, orthopaedic deformities of arthrogryposis are complexes, and many surgeons want to correct them without taking care of the whole patient who often have excellent intellectual abilities. Dubousset collected answers of 65 arthrogryposis adult patients to the following question: "*what is the function you missed most during your life?"* Most of them emphasize that involvement of the upper limbs was the most disabling, more than the absence of walking, because they have a high level of intelligence. They also appreciated the time spent during their childhood in adapted Center for rehabilitation and school activities [1].



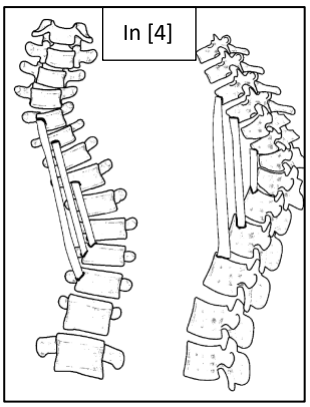
In [2]

Another specific field concerns bone tumours with more than 45 papers. Functional surgery was Dubousset's priority, and he demonstrated that "*en bloc resection*" and reconstruction with knee prosthesis gave better results than amputation. As one major problem was the reconstruction of the muscles, he described in 1985 two muscle-plasty techniques using gastrocnemius flaps to reconstruct the quadriceps [2]. Twenty-five years later, as he was convinced that biologic bone offers better long-term results than prosthesis in metaphyso-diaphyseal resection, he worked with his partners on the use of free vascularized fibula graft [3].

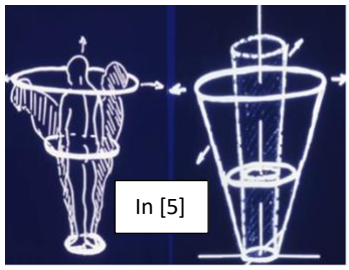
But Jean Dubousset is well-known as a scoliosis Master. Almost 150 publications and thousands of lectures concern spine deformities. His production is enormous and he developed his ideas in many directions: he started with Ginette Duval-Beaupère on *a unique theory of the course of scoliosis* (1970) and *the progressive rotational dislocation of the spine* (1972). He and his wife Anne-Marie Dubousset worked on the spare of blood loss during spine surgery (1981). In the 80's, he used the new technologies to measure the 3D deformities of scoliosis, and he developed a huge activity at l'École Nationale Supérieure des Arts et Métiers (ENSAM), Paris, with François Lavaste and Wafa Skalli working on finite elements and experimental spine and intervertebral disk studies. Many fellows developed research programs for their thesis. In 1984, with Yves Cotrel, they demonstrated a derotation of the spine with a new universal posterior osteosynthesis named CD. During a sabbatical year in the USA in 1989, with Harry Shuffelbarger and Tony Herring, they demonstrated the concept of *the crankshaft phenomenon*. In the 90's, after working on pinealectomy in chicken, he and Masafumi Machida thought that melatonin was one of the etiological factor of idiopathic scoliosis. Before the end of the XXth century, as he wanted to decrease the irradiation rate of X-rays, he participated with the Nobel Price Georges Charpak to the development of the EOS currently used for 3D spine and lower limbs deformity measurements; and with Dror Ovadia, he contributed to the development of a radiation free optical system to evaluate the 3D planes of scoliosis. He described the spine penetration index; he was interesting by anatomy of the muscles to improve the surgical approach of the spine. He emphasized on the risk of neurological complication in severe congenital scoliosis and in kyphosis. He described that the sacrum should be considered as the pelvic vertebrae in neuro-muscular deformities, and its fixation with ilio-sacral screws. He also published on the anterior approach either with a solid tibial graft or a new instrumentation with Christoph Hopf named CDH. Finally,

he and Lofti Miladi worked on a minimally invasive instrumentation in neuro-muscular diseases. In conclusion, Dubousset's contributions cover almost all aspects of the spine deformities.

Among all these papers, some should be known to avoid severe complications. Reinhard Zeller and Jean Dubousset studied a series of severe kyphoscoliotic deformities with congenital, neurofibromatosis or other aetiology. This angular kyphosis develops between two lordotic curves and the risk of neurologic complication is very high. The treatment needs a combined posterior and anterior approach with a strut tibial bone graft in the anterior [4].



But Dubousset's major topic is the balance of the spine. For him, equilibrium of the 3D spine means that the head, including the vestibular organs, must be on the strict vertical alignment with the feet. He was disappointed by some rigid instrumentations which lead to an almost strait segment of the spine and induce a proximal junctional kyphosis, a new post-operative acquired deformity [5]. He preferred some post-operative degrees of residual curve as far as the sagittal plane of the spine was almost normal.



For these reasons, it is interesting to read some papers published in last years of his life, when he was still working as member of both French National Academy of Medicine and of Surgery. As a legacy, let us read again Jean Dubousset [6]:

- "*The most important part of a spine undergoing a spinal instrumentation is not the instrumented one but the one not instrumented left free above and below especially because these parts work to give compensation, movements and balance in 3D to give permanent adaptation".*
- *Despite the major improvement in surgical techniques thanks to the development and expertise in paediatric anaesthesia and spinal cord monitoring allowing to address more and more difficult cases, the most important message for the paediatric orthopaedic surgeons dealing with a deformity of the spine is to reach the goal of Harmony as well for the external 3D aspect of the patient as for the dynamic balance in the 3D from head to feet, because it is the best guarantee for the future functions in the adulthood and elderly time of the life".*

Hobbies

Jean Dubousset loved to draw himself his ideas and concepts as this young boy dedicated to R Zeller. When he had some free time, he was doing glasswork and he rehabilitated the stained-glass windows of a chapel closed to his home. With his wife Anne-Marie, this beautiful couple travelled permanently around the world.

Monsieur Jean was a great humanist. He loved his patients and his fellows. He is the mentor of many surgeons around the world. One of his favourite messages was:" *what you give to the others belongs to you for ever. What you keep towards you is lost for ever*".

Top 6 References

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Jean Dubousset with his wife Anne-Marie in their Paris flat, and Reinhard Zeller - 2024
Photos: Coll. R. Zeller

Jean Dubousset
Pre operative halo-traction

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