

History of Solid Organ Transplantation at the University of Liège

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Early years and laboratory research

Doctor Georges Lejeune, who was just graduated MD and was working in the laboratory of Pr Albert, read in 1953 the paper published by Pr P. B. Medawar in Nature, and entitled : "Actively acquired tolerance to foreign cells". Following this paper, regular contacts were conducted with Pr P. B. Medawar, and in 1959 an International Symposium on "Biological problems of grafting" was organised in Liège under the presidency of Pr P. B. Medawar (Fig. 1). Most participants were well known, as for example Pr Owen, Pr Simonsen, Pr Trentin and Pr Voisin. The proceedings of this symposium

were published (Fig. 2). One year later, in 1960, Pr P. B. Medawar received his Nobel price.

In the University of Liège surgical research laboratory, investigators were focused on immunological reaction to homograft at that time (1). Many experiments of skin and kidney transplantation were performed on mice and dogs (2). The personal investigations of Pr Georges Lejeune were summarised in his thesis : "Contribution à l'étude des réponses de l'hôte à l'homogreffe cutanée" in 1962. Parallel to this basic science research, Pr Georges Lejeune was investigating techniques of kidney graft preservation with the Belzer machine (Fig. 3, 4) (3).

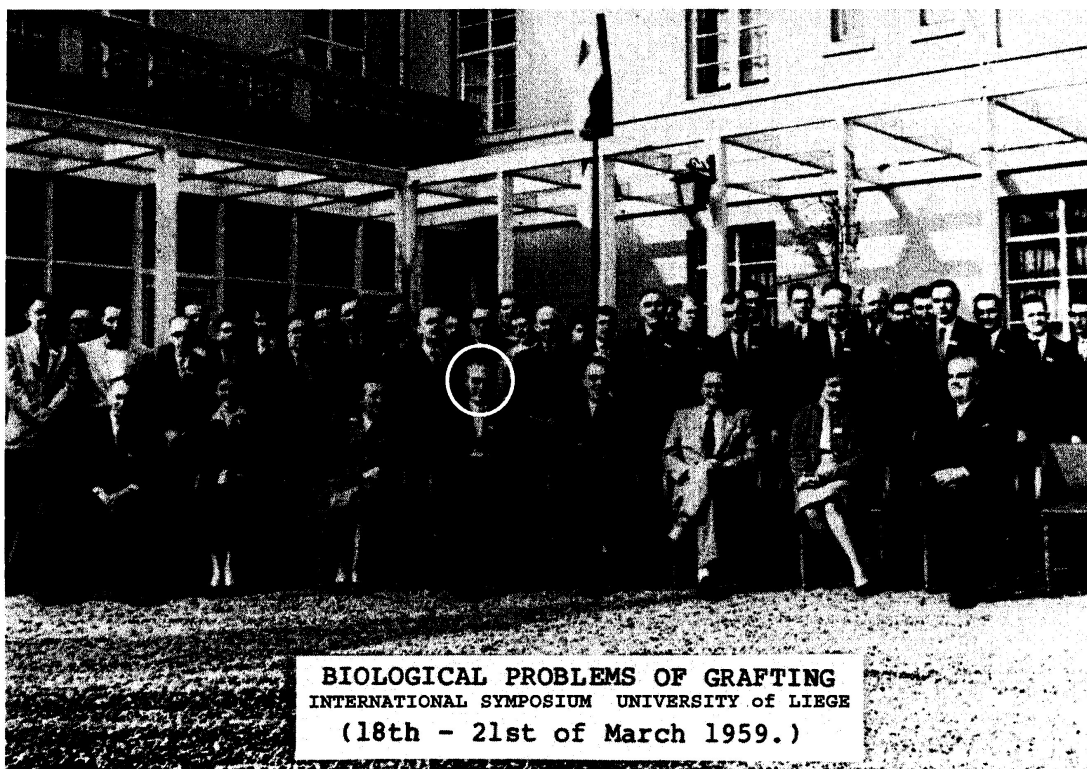


Fig. 1

○ Prof. Medawar Peter, University College of London (U.K.)

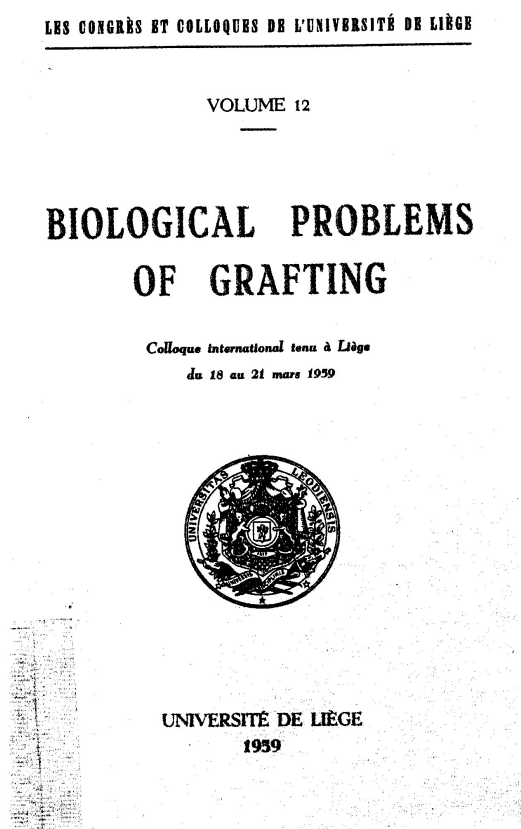


Fig. 2

The laboratory of surgical research was also opened to other several surgeons. Dr O. Grosjean and Dr H. Otte focused on pulmonary transplantation and performed many animal experiments that were very famous and allowed them to summarise their experience in a thesis (4-8). Pr N. Jacquet was at that time very interested on the management of cirrhosis and its complications, as portal hypertension and liver failure (9). He conducted many experiences of liver transplantation in animals (10).

Since 1990, Pr J. O. Defraigne has been applied in a research-program on oxygen-derived free radical production after ischemia-reperfusion of the kidney in rabbits (11). He became director of the Experimental Laboratory for Surgery (CREDEC : Centre de Recherche Expérimentale du Département de Chirurgie) at the University of Liège.



Fig. 3

At the same time, Professor LEJEUNE is investigating the preservation of kidneys with the Belzer Technique.

Kidney and Pancreas transplantation programs

All this basic science and animal research lead to the first kidney transplantation at the University of Liège, on July 1st, 1965, just 24 months after the first Belgian attempt at UCL. This first case started a successful program of kidney transplantation and harvesting (12, 13). The first living related kidney transplantation was performed on November 26th, 1968, when a father, selected as the best suitable donor based on the then starting HLA system, gave a kidney to his son. This kidney is still functioning 35 years later, on azathioprine and small doses of steroids.

This kidney transplant program is still very active, thanks to the pioneer work of Pr G. Lejeune followed by Pr M. Meurisse, with more than 650 procedures to date. Every aspects of kidney transplantation are actually covered by the University of Liège team, including pediatric kidney transplantation, living related kidney transplantation after laparoscopic harvesting (14), non heart beating donors and combined procedures with the heart or the liver.

Pr Meurisse, who was coming back from a fellowship in pancreas transplantation under the auspices of Pr Dubernard at Lyon University, performed the first combined kidney and pancreas transplantation at the University of Liège on October 18th, 1984 (15). This pancreas transplant program is also still very active with an increasing number of combined kidney and pancreas, liver and pancreas, or pancreas alone, transplantations (16).

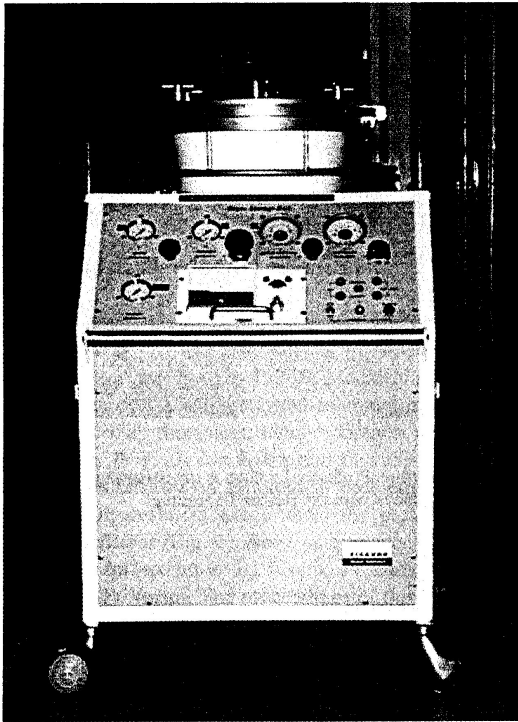


Fig. 4

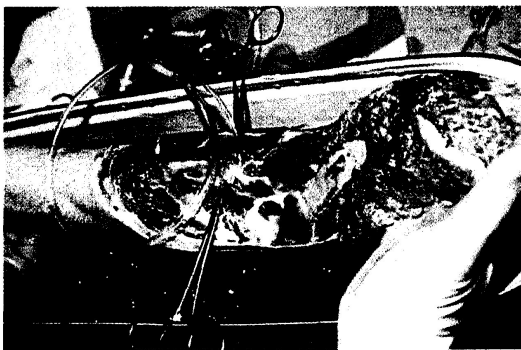


Fig. 5

In the early seventies, Prof. LEJEUNE developed the microsurgical technique for limb/arm re-implantation.

Arm replantation and hand surgery

Pr G Lejeune was also very interested in hand surgery and arm replantation. In this program, a complete oblique section of the left arm at the elbow was replanted on the 4th March, 1971 (Fig. 5). This patient was a carpenter and his replantation was the first case in Belgium and the second in Europe (17). The patient became postman and is still working with a moderate dysfunction of the hand (Fig. 6). This case encouraged Pr G Lejeune to start an emergency unit for hand surgery (SOS main) and was successfully followed by Pr A. Carlier, who developed several microsurgical techniques and is now famous in hand surgery.

Heart transplantation

Pr R. Limet, after a fellowship in the United States (Pr De Bakey) and in Montreal, (Pr Grondin) built in the late seventies and early eighties a very successful openheart surgery program, with more than 1000 open heart surgical procedures every year. This leads to the first cardiac transplantation on February 9th, 1983. More than 280 cardiac transplantations have been performed since then, in one of the most active Belgian programs (18).

We observed an increased incidence of abdominal aortic aneurysm in heart recipients (19, 20).

Liver transplantation

After several animal experiments, Pr N. Jacquet supported the hepatic function of a young woman dying from liver failure, by the extracorporeal perfusion of an animal liver on the recipient femoral vessels. These experiments were very innovative in the early seventies (21). The patient died but this experiment gave several very valuable data.

But the liver transplantation program definitely started after a several month stay of Pr P. Honoré in the department of Pr T Starzl in Pittsburg, United-States. The first liver transplantation was performed on June 20th, 1986. This program is also still very active (more than 270 procedures in adults and children) (22). This program, in association with Pr R. Limet, performed the first Belgian case of combined liver and heart transplantation in 1995 (23). The improvement of surgical and management techniques allowed bloodless procedures and the first Belgian liver transplantation in a Jehovah's witness in 1998 (24). Moreover a living related liver program in adults started in 2002, and the first European living related liver transplantation in a Jehovah's witness was performed at the University of Liège, CHU Sart Tilman in March 2002 (25).



Fig. 6

The patient L. H. with reimplanted left upper limb, (on march 4, 1971) 32 years later (photo of 2003 !).

References

- DORDEVIC L., LEJEUNE G., DEGIOVANNI G., HAENEN-SEVERYNS A. M. Influence of the method of administration of antilymphocyte serum in the mouse exposed to a cutaneous allogenic graft. *C R Seances Soc Biol Fil*, 1969, **163** : 1243-6.
- HAENEN-SEVERYNS A. M., DEGIOVANNI G., LEJEUNE G. *et al.* Production of rabbit antilymphocyte serum from soluble and semipurified antigens. *Acta Chir Belg*, 1970, **69** : 543-51.
- LEJEUNE G., BOELAERT J., GODON J. P. *et al.* Kidney preservation : methods and functional evaluation. *Acta Chir Belg*, 1970, **69** : 503-13.
- OTTE H., GROSJEAN O., MULDER M. *et al.* Immunosuppressive therapy applied to allogenic lung transplants). *Eur Surg Res*, 1970, **2** : 213-20.
- GROSJEAN O., OTTE H., NAMUR M. *et al.* Experiments preliminary to homologous pulmonary transplantation associated with direct contralateral pneumectomy. *Acta Chir Belg*, 1969, **68** : 586-92.
- GROSJEAN O., SIMAR L., LEROUX G. *et al.* Radiologic and microscopic comparative study of the reaction of homologous pulmonary transplant rejection in untreated dogs. *Acta Chir Belg*, 1969, **68** : 577-85.
- GROSJEAN O., OTTE H., LEJEUNE G., HONORÉ D. Current state of our research on pulmonary transplantation. *Rev Med Liege*, 1970, **25** : 459-63.
- GROSJEAN O., NOIRCLERC M., DUVINAGE J. F. *et al.* Bilateral lung transplantation. Preliminary report. *Acta Chir Belg*, 1972, Suppl 2 : 49-55.
- JACQUET N. Distal splenorenal anastomosis in the treatment of portal hypertension in the cirrhotic patient). *Acta Chir Belg*, 1974, **73** : 539-53.
- BIVER A., JACQUET N., MOOR M. C., LAMY M. Combined azaperone and metomidate anaesthesia in liver transplantation in the pig. *Eur Surg Res*, 1976, **8** : 81-8.
- DEFRAIGNE J. O., PINGEMAIL J., FRANSSSEN C. *et al.* In vivo free radical production after cross-clamping and reperfusion of the renal artery in the rabbit. *Cardiovasc Surg*, 1993, **1** (4) : 343-349.
- LEJEUNE G. Progress in the area of transplantation. *Rev Med Liege*, 1970, **25** : 186-87.
- LEJEUNE G., HONORÉ D., HANQUET M. *et al.* Contribution of the Liege transplantation center to the international exchange of human kidneys. *Rev Med Liege*, 1971, **26** : 701-4.
- DEFECHEREUX T., HAMOIR E., DETRY O. *et al.* Laparoscopic live donor nephrectomy : initial experience. *Acta Chir Belg*, 1999, **99** : 179-81.
- MEURISSE M., BEAUJEAN M. A., HONORÉ P. *et al.* Combined kidney-pancreas graft in terminal diabetic nephropathy. Report on the first transplantation performed at the University of Liege. *Rev Med Liege*, 1986, **41** : 855-63.
- DE ROOVER A., DETRY O., HAMOIR E. *et al.* Update on pancreatic transplantation. *Rev Med Liege*, 2001, **56** : 557-62.
- HONORÉ D., LEJEUNE G., HANQUET M. *et al.* A case of reimplantation for total traumatic section of the left arm. *Rev Med Liege*, 1972, **27** : 725-7.
- LIMET R. Heart transplant. Indications and results. *Rev Med Liege*, 1987, **42** : 403-5.
- DEFRAIGNE J. O., SAKALIHASAN N., DEMOULIN J. C., LIMET R. Successful abdominal aortic aneurysm resection in long-term survivors of cardiac transplantation. *Cardiovasc Surg*, 1995, **3** : 321-324.
- DEFRAIGNE J. O., VAHDAT O., LAVIGNE J. P., DEMOULIN J. C., LIMET R. Aneurysm of the ascending aorta after cardiac transplantation. *Ann Thorac Surg*, 1992, **54** : 983-984.
- JACQUET N., MATHIEU P., BIVER A. *et al.* Trial treatment of experimental hepatic coma in swine by heterotopic allotransplant. *C R Seances Soc Biol Fil*, 1973, **167** : 1309-10.
- HONORÉ P., DETRY O., MEURISSE M., JACQUET N. Liver transplantation : experiences and results of a program at the University of Liege. *Rev Med Liege*, 1998, **53** : 735-7.

23. DETRY O., HONORÉ P., MEURISSE M. *et al.* Advantages of inferior vena caval flow preservation in combined transplantation of the liver and heart. *Transplant Int*, 1997, **10** : 150-1.
24. DETRY O., HONORÉ P., DELWAIDE J. *et al.* Liver transplantation in a Jehovah's witness. *Lancet*, 1999, **356** : 1680.
25. DETRY O., DE ROOVER A., KABA A. *et al.* Right lobe living related liver transplantation in a Jehovah's witness. *Transpl Int*, 2003 (*In Proof*).

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