ВПЕРВЫЕ НА НОБЕЛЕВСКУЮ ПРЕМИЮ НОМИНИРУЕТСЯ МИКРОХИРУРГ

FOR THE FIRST TIME IN THE NOBEL PRIZE NOMINATED MICROSURGEON

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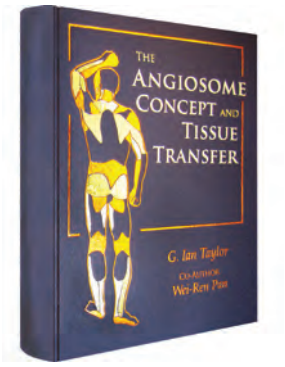
В журнале Annals of Plastic Surgery (2014, V. 72, Issue 6, p. 613) была опубликована редакторская статья W. Lineaweaver «A Nobel Nomination for G. Ian Taylor, MD» в связи с публикацией двухтомника «The Angiosome Concept and Tissue Transfer» (2014). Краткая рецензия на этот труд и обобщение итогов научной деятельности знаменитого австралийского микрохирурга и анатома завершается рекомендацией представления работ G. I. Taylor в Нобелевский комитет. Мы хотим познакомить российских хирургов с краткой научной биографией номинанта, опубликованной в «History of Microsurgery» (Ed. J. K. Terzis)*, а также проинформировать читателей о представлении поддержки G. I. Taylor в качестве номинанта на Нобелевскую премию по физиологии и медицине.



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Submitted: 1991

Ian Taylor, early 70s

1968–1975

Although I have been involved in replantation surgery, my main experience and contributions have been in the areas of microneural surgery, microvascular transplantation, basic anatomical research into die blood supply of various tissues for local and free flap transfer and, to some extent, the reversal of vasectomy and tubal ligation.

The First Decade 1957-1968

In 1957, microsurgery was farthest from my mind. I was in my final secondary school (college) education at Melbourne Grammar studying for my "A" levels, prior to commencing my University degree in Medicine. However, I participated in a sport, which was to have a profound influence on my microsurgical career. It was to provide me with the stamina to cope with the long hours of the early microsurgical procedures. The sport was rowing and I have maintained an interest in rowing to this tune and have coached crews for the last six years.

From 1958 to 1963, I studied at the University of Melbourne and the Royal Melbourne Hospital producing my MBBS in December of the latter year. During this time, I was a medical student under Sir Benjamin Rank, John Hueston and Frank Ham. They introduced me to plastic surgery. I was impressed by their technical expertise, and in particular, their meticulous attention to detail.

During the period 1964 to 1968, I trained at the Royal Melbourne Hospital, obtaining my Fellowship of The Royal Australasian College of Surgeons in the last year. Several events had an important influence on my future interest in microsurgery over these years and I will list them briefly.

(l) To become a fellow of the Royal Australasian College of Surgeons, I had to pass two exams. Part I was a basic science exam, encompassing anatomy (in meticulous detail), physiology and pathology. The second part was a clinical exam, which in

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those days embraced General Surgery and ALL of the specialities. There was no exam in Plastic Surgery.

Being ill-prepared, I "had a go" at Part I. Having never failed an exam, I passed physiology and pathology and missed out on anatomy. In retrospect, this was fortuitous. My preparation for the next attempt was so thorough, that I could not be faulted in any area of anatomy, and was invited by the College to lecture in Anatomy for the next three years. I think the seed was sown then for my current interest in the vascular anatomy of the human body.

(2) I was privileged to train, on separate occasions, under Sir Benjamin Rank in 1965 and John Hueston in 1966. Benny taught me the basic principles and philosophy of Plastic Surgery, the meticulous attention to detail that was required, how to diagnose the problem, to assess the options available and, above all, to put the patient first. One of his favorite sayings was, "Son, NEVER make the patient fit the operation, always match the procedure to the patient's particular needs." I believe that this was the basic philosophy, which subsequently stimulated me to design various microsurgical procedures to solve unusual clinical problems as they confronted me.

Benny stressed conservatism and the need for a lifeboat – a back up procedure if your first operation failed – which today is one of the most basic principles of microvascular surgery. This was the era of the tube pedicle and the rigid length to breadth ration of flaps designed randomly on vessels in different areas. I was trained in procedures which are virtually unknown to some of today's younger surgeons. This, I believe, is fortunate, for not only do I have a wider range of options, but I am also acutely aware of their limitations and potential complications.

The following year, Benny retired and I trained under John Hueston. He, in turn, had trained under Benny Rank and Alan Wakefield. John was a brilliant surgeon with a profound knowledge of anatomy, pathology and basic principles of surgery. He was an innovator. If an operation did not exist, he would invent one. Two other surgeons, both working in John Hueston's unit at the Royal Melbourne Hospital, had a major impact on my career. One was Donald Marshall, another innovative surgeon, who like John, had an artistic flair and exceptional surgical dexterity. The other was Frank Ham, a safe, conservative and meticulous surgeon, who rarely had complications.

The Unit was vibrant and progressive. Bakamjian had just introduced his deltopectoral flap and Plastic Surgery was entering a new era. Flaps were taken to the limits of their viability and sometimes beyond. Rigid length to breadth ratios were being questioned and attention was being focused on the anatomy of the supplying vessels.

In 1967, I worked as a General Surgical

* Terzis, J.K.: History of microsurgery – 5 generations from 1957. IIRM, 2007

Taylor, 1981,- A great innovator, anatomist and contributor to microvascular surgery

Taylor, Terzis and colleague in Taylor's office in 1981, Melbourne, Australia

Registrar under Professor Maurice Ewing. Renal transplantation was in its infancy. I witnessed the problems associated with the macrovascular anastomoses and the immune response. Peter Morris later set up a research department, and one of his projects involved renal transplants in rats. He had two technicians who could transplant a kidney from one rat to another in 20 minutes, which included an arterial, a venous and a ureteric anastomosis. I was amazed at their skill and I think this kindled my interest in microvascular surgery. Little did I realize then, that these two technicians would teach me their art in subsequent years.

This brings me to the end of the first decade. I made no contributions to Microsurgery, but the foundations were established for my future interests in this field. In summary, they consisted of: stamina, persistence and the team spirit provided by rowing; a detailed knowledge of anatomy, which followed my failed first attempt at passing the Part I of my FRACS exam; a sound grounding in the principles and art of Plastic Surgery under Benny Rank and John Hueston during a period of change which heralded the Anatomical Renaissance in our specialty; and the beginning of an interest in microsurgery obtained from my general surgery registrar years. Above all, I believe the most fundamental lesson I learned was to assess the patient carefully and then to design an operation, where appropriate, to match the particular patient's needs.

Counter clockwise from right: Merritt, Taylor, Terzis, Millesi and Australian colleagues

The Second Decade 1969–1979

After obtaining my FRACS in General Surgery in 1968, I trained continuously in plastic surgery for three years.

In 1969, I worked as Plastic Surgery Registrar at The Victorian Plastic Surgery Unit at Preston and Northcote Community Hospital in Melbourne. This Unit, established by Sir Benjamin Rank, was unique in that it was attended on a part-time basis by some 18 visiting plastic surgeons from the other teaching hospitals in Melbourne. Once again, I trained under Benny in the twilight of his surgical years. By now, the microscope was being used by some surgeons to repair nerves and it was here that I was first introduced to the technique.

In 1970 and 1971, I gained further training in Bristol, U.K. under Dennis Bodenham, Roy Routledge, Ron Hiles and Ron Pigott. Several events had a major influence on my direction towards microsurgery in general and microvascular surgery in particular.

(1) I visited Canniesburn Hospital in Glasgow, where Ian McGreggor and Ian Jackson were developing the groin flap. I was excited by this new flap, and on the suggestion of Ron Pigott, I used the technique on my return to Bristol, thinning the distal portion of the flap to resurface hand injuries. I was interested in the anatomy of the supplying vessels and decided to investigate this upon my return to Australia.

(2) Tom Gibson, then editor of the British

Journal of Plastic Surgery, had made the prediction that "if the vessels of an axial flap could be detached and reanastomosed to vessels at a distant site, then this would change the face of plastic surgery."

(3) Reports of microvascular transplants in animals were appearing in the literature from the United States by Krisek, Goldwyn and Buncke. At a journal club, a case report was presented of a failed attest by an Indian surgeon (I cannot recall the name, but I believe it was published in B.J.P.S.) to do a transfer in a patient with Romberg's disease.

I returned to Australia in January, 1972 and was appointed as an Assistant Plastic Surgeon to John Hueston at the Royal Melbourne Hospital and held a similar appointment to Frank Ham at Preston & Northcote Community Hospital. I pursued my interest in the groin flap, doing several dissections in the mortuary at the Royal Melbourne. By this time, Earl Owen and Paul Lendvay were presenting their results of replantation surgery, as well as Bernard O'Brien at St. Vincent's Hospital in Melbourne. My experience with the microscope was still confined to the repair of nerves, but I started to dabble in the repair of vessels with Peter Morris' technicians at The Royal Melbourne Hospital.

Later that year, Rollin Daniel arrived from Canada to work with Bernard O'Brien

Taylor (center) describing the "angiosome" concept to Millesi and Merritt in 1981, in Melbourne, Australia

Millesi, Terzis, patient, Taylor – 1981, Melbourne, Australia This was the patient that received the first vascularized nerve graft the superficial radial nerve) performed by Taylor for the repair of a right median nerve lesion

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and told us of his work with flap transfers in pigs. Rollin and I became close friends. He was interested in my cadaver disections of the groin flap and my clinical experience of thinning these flaps. On his nights and weekends, he would assist me when 1 was on- call for emergencies. There were lots of them, as the Junior Consultant did most of the after-hours work.

On January 13th, 1973, when Frank Ham was on holidays and I was left in charge of the Plastic Unit at Preston and Northcote Community Hospital, a young man was admitted with a severe compound ankle injury, a fractured pelvis and a chest injury. I was asked by our Orthopaedic Surgeon at P.A.N.C.H., to manage this patient. The rest is history. The free flap operation which evolved, was done to save this lad's leg from amputation, a procedure which was designed to solve this particular patient's problem – the principle fundamental to my training from Benny Rank and John Hueston.

The Third Decade 1980-1990

This is the period during which I was involved extensively with fresh human cadaver injections to define the vascular anatomy of the various tissues of the body for local and free flap transfer. At first, various regions were studied by injection of nominated arteries with different colored dyes, by dissection and by radiographic analysis after injections with either barium sulphate or a mixture containing lead oxide.

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Subsequently, the study was expanded to encompass the entire body and resulted in the "angiosome" concept.

Next, I decided to tackle the anatomy of the venous system, commencing with the muscles of the body. This was expanded to encompass the entire body and resulted in the "venosome" concept. Finally, the Doppler Probe was used clinically to identify the cutaneous perforators. This information was correlated with our anatomical studies, thus providing the link between the dissecting room and the operating theater.

During this period, several operative techniques evolved and several clinical problems were solved by our anatomical studies. These included: 1) the development of a new free vascularized nerve flap designed on the venous system; 2) the extended deep inferior epigastric rectus abdominus flap; 3) a new technique of transferring the shaft and the proximal growth plate on the anterior tibial vessels; 4) a lead oxide injection technique modified from that originally described by Michel Salmon; 5) definition of those ribs, which were supplied by the pectoral artery in the pectoralis major musculocutaneous flap; 6) definition of the blood supply of the anterior abdominal wall and, in particular, The Territories of the lower T.R.A.M. flap.

Terzis, Taylor and Baudet watching Greek dancers in the island of Kos, in 1992

ПРЕДСТАВЛЕНИЕ НА НОБЕЛЕВСКУЮ ПРЕМИЮ ОТ НИИ МИКРОХИРУРГИИ (Г. ТОМСК, РОССИЯ)

В 1976 г. в журнале «Пластическая и реконструктивная хирургия» д-р G. Ian Taylor впервые высказал идею супермикрохирургии (статья «The free vascularized nerve graft. A further experimental and clinical application of microvascular techniques»). Это стало отправной точкой для развития современной реконструктивной и пластической хирургии.

В основе формирования как свободных, так и несвободных аутотрансплантатов для замещения дефектов тканей человеческого организма лежит концепция «ангиосомного строения тела человека», разработанная Ian Taylor. Его работа помогает понять необходимость соблюдения соотношений между шириной и длиной лоскутов при выполнении филатовского стебля, что предотвращает развитие периферического некроза перемещаемых тканей. Однако более мощным прорывом можно считать возможность выполнения перфораторных лоскутов и лоскутов, в состав которых входят не только мягкие ткани, но и костная ткань.

В 1975 г. д-р G. Ian Taylor предложил для замещения костных дефектов головы и шеи при опухолях использовать кровоснабжаемые костные трансплантаты из бедренной и малоберцовой кости (статья «The free vascularized bone graft. A clinical extension of microvascular techniques»).

В 1980 г. после общения с G. Ian Taylor Claudio Angrigiani (Аргентина) опубликовал работу о «независимом кровоснабжении кожи передней поверхности бедра в области расположения *m. rectus femoris* et *m. vastus lateralis*». Эти тонкие лоскуты кровоснабжались сосудами, идущими от осевых сосудов через мышцы к коже. Позднее их стали называть перфораторными. В настоящее время это одни из наиболее перспективных лоскутов, поскольку их единственным недостатком является техническая сложность в выполнении. В остальном они удовлетворяют всем современным требованиям пластической и реконструктивной микрохирургии. Поэтому по всему миру проводятся исследования, посвященные изучению кровоснабжения этих лоскутов.

Следует отметить, что огромные достижения пластической хирургии связаны с разработкой нейро-кожных лоскутов. И в эту область д-р G. Ian Taylor внес свой вклад. Именно им впервые было рассмотрено кровоснабжение и венозный дренаж в периферических нервах (статьи «The free vascularized nerve graft. A further experimental and clinical application of microvascu-

lar techniques», «The venous drainage of nerves: anatomical study and clinical implications»). Не менее интересным является и тот факт, что при формировании нейро-кожных лоскутов следует учитывать строение нейросома, как и при формировании «перфораторных» лоскутов необходимо учитывать строение ангиосомов.

Итогом 40-летней работы этого исследователя стал выход в свет его фундаментального труда «The Angiosome Concept and Tissue Transfer».

Учитывая огромный вклад д-ра G. Ian Taylor, коллектив НИИ микрохирургии (г. Томск, Россия) считает, что его работа заслуживает рассмотрения в Нобелевском комитете.

PRESENTATION ON THE NOBEL PRIZE FROM THE INSTITUTE OF MICROSURGERY (TOMSK, RUSSIA)

In the 1976 Journal "Plastic and Reconstructive Surgery" Dr. G. Ian Taylor first expressed the idea of supermicrosurgery (Article: "The free vascularized nerve graft. A further experimental and clinical application of microvascular techniques"). This was the starting point for the development of modern reconstructive and plastic surgery.

The basis of the formation of both free and island flaps for covering tissue defects of the human body is the concept of "angiosome structure of the human body", developed by Ian Taylor. His work helps to understand the need of knowledge the relationship between width and length of the Gilles flap, which prevents the development of peripheral tissue necrosis. However, a more powerful breakthrough to be considered is the opportunity to perform perforator flaps and flaps, which include not only the soft tissue, but bone.

In 1975, Dr. G. Ian Taylor suggested using the free femur and free fibula grafts for bone defects of the head and neck tumors with (Article "The free vascularized bone graft. A clinical extension of microvascular techniques").

In 1980, after a conversation with G. Ian Taylor, Claudio Angrigiani (Argentina) published a paper on "independent blood supply of the skin in front of the thigh area *m.rectus femoris* et *m.vastus lateralis*". These thin flaps were perfused by vessels coming from the axial vessels through the muscles to the skin. Later they became known as "perforator." It is currently one of the most promising flaps with only one disadvantage: the technical difficulty in performing. They otherwise meet all the requirements of modern plastic and reconstructive microsurgery, resulting in a global study on the supply of blood to these flaps.

It should be noted that some of the great achievements of plastic surgery are associated with the development of neuro-cutaneous flaps. Dr. G. Ian Taylor contributed – it was the first time blood supply and venous drainage in peripheral nerves was considered (Article: "The free vascularized nerve graft. A further experimental and clinical application of microvascular techniques"; "The venous drainage of nerves: anatomical study and clinical implications"). No less interesting, in my opinion is the fact that the neurosome structure is considered in the formation of the neuro-skin flaps, similar like angiosome structure is considered in the formation of the "perforator" flap.

The result of 40 years of work by this researcher was the publication of his seminal work "The Angiosome Concept and Tissue Transfer".

Given the enormous contributions of Dr. G. Ian Taylor, staff of Institute of Microsurgery (Tomsk, Russia) believe that his work is worthy of consideration in the Nobel Committee.

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