A SHORT HISTORY OF THE DEVELOPMENT OF VITREORETINAL SURGERY

The modern era of posterior eye segment surgery, i.e. surgery of the vitreous and the retina, began about 80 years ago when Jules Gonin realized that detachment of the retina occurred because of a hole in the retina and he tried to close it surgically from the outside. The full development of this surgery in the decades that followed involved endeavouring to improve the surgical technique without ever questioning Gonin’s discovery or the principle of his surgical treatment.

The external approach, however, could not be applied effectively enough in more complicated patho-anatomical situations or in conditions where the relationship between the vitreous and the retina in the eye was more seriously disturbed. For many years, inadequate technical skills and limited knowledge and insight into the development and dynamics of patho-anatomical relationships as well as the misinterpretation of these stood in the way of an internal surgical approach and the effective treatment of complicated patho-anatomical disorders in the posterior segment. In the early seventies, on the basis of David Kasner’s clinical experience in removing the vitreous surgically from the open eye, Robert Machemer introduced instrumental pars plana vitrectomy and in this way, for the first time, successfully removed the diseased vitreous in a closed way under microscopic control.

The new technique introduced a new era in the treatment and knowledge of pathological processes in the interior of the eye.

Parallel to this development, John Scott, building on Paul Cibis’ clinical experience with silicone oil injection in complicated retinal detachment, improved the technique by using the hydraulic power of the silicone oil and introducing intraocular micro-instruments in the eye. Restoring the relationship between the vitreous and the retina in this way, he then left silicone oil in the eye as a long-term tamponade. Each method in its own way represents a giant step forward, and compared to the previous stage in eye surgery, remarkable results were now achieved in the treatment of previously inoperable cases. After a few enthusiastic years of gaining experience in applying the new surgery in increasingly difficult cases, it became apparent that the possibilities of both techniques in treatment of extremely difficult cases were limited. In cases where the retina was incarcerated or shrunken, removal of the vitreous and scarred tissue from the retina was insufficient to achieve a satisfactory anatomical result.

In the early eighties, using the new methods in increasingly complicated cases, we came to the conclusion that in certain situations, only surgical treatment of the retina itself could lead to a successful outcome. Using this surgical approach in many extremely difficult cases, we eventually developed a surgical concept for treatment that consisted in the maximum possible vitrectomy, retinal surgery and temporary injection of silicone oil, which served as the tamponade and stabilised the eye. This surgical concept in the treatment of difficult cases became widely accepted in the 80s and the 90s, it served as the basis for the development of macular surgery and relocation of the retina.
POSSIBILITIES AND LIMITATIONS OF VITREORETINAL SURGERY

Vitrectomy in combination with retinal surgery and silicone oil is indicated in complicated cases of retinal detachment and giant retinal tears with proliferative vitreoretinopathy (PVR), as well as in retinal detachment with PVR after perforating injuries and in difficult cases of traction detachment in diabetic retinopathy.

Taking into account that all these cases involve \textit{not only a surgical problem} but basically a biological-proliferative process, it is obvious that surgical therapy alone is but a partial solution to the problem. The biological factor is also the primary cause of frequent recurrences, requiring repeated operations despite surgery being performed correctly each time; it is also the reason for the treatment resulting in only modest functional success.

The frequent recurrences, repeated operations and modest final results — \textit{while on the one hand, this is all very frustrating to the surgeon, on the other hand, these cases provide the surgeon with tremendous challenges in striving for the best possible outcome of the operation. The surgeon faces a wide diversity of pathology, exciting and creative surgery as well as an unpredictable outcome. From the patients’ perspective, they struggle with the recurrences, repeated operations, functional ups and downs and the uncertain final outcome — it is a heavy burden. In my experience, however, if well informed and counselled during the treatment, the large majority of patients (not only the one-eyed who have no other choice) are ready to fight to the end, and are ultimately satisfied even with a minimal functional improvement. In the end, after a long, difficult treatment process with the patient and the surgeon being focused on a common goal, they develop a special relationship, which adds a particular human aspect to the whole affair, something that is definitely threatened in the practice of day surgery, with 20 operations being performed daily at a 99% success rate.}

Finally, one more group indicated for this treatment are those with macular pathology. This group of patients differs from the others already mentioned in that local pathology is involved, and the condition of the vitreous and retina is more or less normal. Except for local changes in the macula it mostly concerns biologically and anatomically normal eyes. Therefore, though certainly not easy, this surgery proceeds according to the established procedure. The number of preoperative complications is relatively small, the results are relatively good and the duration of the operation predictable. All this has contributed to the great popularity of this surgery in the last few years.

VITREORETINAL SURGERY TODAY

Unfortunately it is no exaggeration to say that the interest \textit{in the surgery} of so-called difficult cases, except for macular cases, has diminished considerably at professional meetings and in other settings, and the number of medical centers that actually treat such cases are few and continue to decrease. In my opinion, this development is not \textit{favourable, and it is worth considering the reasons behind this negative trend and whether it can be halted.}
Vitreoretinal surgery, particularly the treatment of difficult cases stirred great interest in the eighties. However, rather quickly, surgeons who were initially enthusiastic about the new, exciting surgery found out that this surgery was not only new & exciting, but also difficult and strenuous and that the results were often very modest and disappointing, then started selecting cases by labelling difficult ones as “hopeless cases” and excluding them from treatment. The reasons for such decisions were varied, both subjective and objective, but the consequences were the same everywhere, and for the patients, often catastrophic. Persistent patients, after a large investment in time and often in an inoperable state, eventually found the rare surgeon who was willing to help them, while the non-persistent patients stayed at home convinced they could not be helped.

This situation, sad in every respect, has been supported by the development of health care in nearly all the developed countries during the last decade. Trying more or less without success to limit the cost of exploding health care, many countries introduced restrictive measures, such as limited budgets for hospitals and specialists, managed health care, etc. The consequences are long waiting lists, patient selection, reduced theatre time, personnel shortages and quarrelling at all levels. It can readily be understood that such conditions leave little room for the treatment of difficult cases requiring long, prolonged and repeated operations. Furthermore, the possibility of being sued for an unsuccessful outcome (a practice on the rise in Europe, coming over from the U.S.A.) does not motivate surgeons to take on complicated cases with uncertain results.

These are some of the reasons for the confusion and uncertainty, which surely does not encourage the relationship between the patient and the surgeon who have to reach a common decision regarding the operation.

The combined effect is that the number of potential and actual patients needing the treatment is increasing while the number of difficult cases actually being operated on is decreasing. But we can also add a positive note: due to the improved results of primary surgery for retinal detachment, better primary treatment of trauma cases and timely laser treatment for diabetic patients, the numbers of complicated cases and candidates for extreme vitreoretinal surgery are decreasing. What is more, the number of centres and surgeons performing vitreoretinal surgery in Europe and particularly in the U.S.A. has increased considerably in the last decade. Yet, these numbers of difficult cases are randomly dispersed over so many places, where for the reasons just given, the majority of centres and surgeons are neither willing nor able to help them adequately.

All this has resulted in the decreasing number of senior surgeons experienced in this surgery who would be able to use their experience for education of their young colleagues.

A young surgeon today who is interested in the surgery and treatment of difficult cases cannot gain the necessary knowledge and skills from experimenting on animals or through computer simulation, but must be able to see enough cases and be trained in the application of the concept in this treatment. Unfortunately, we must agree that the prospects are poor and that the future for these patients is bleak indeed if the situation does not change.

What can be done to change this unfavourable set of circumstances? We can only hope that unsatisfactory systems will be changed, so that surgeons will have less reason to reject the treatment of difficult cases. After all, so-called developing countries such as India, for example, boast excellent institutions where surgeons, paradoxically, work in better and more
stimulating conditions than in many places in Europe; therefore, we need not fear that vitreoretinal surgery will be reduced to the treatment of less difficult cases only. But yet, in Europe and in the U.S., while the present situation prevails, the only solution is to concentrate the treatment of such patients in a limited number of centres and bring an end to this hypocritical situation where everyone claims they can do everything, while the majority is neither willing nor able to treat difficult cases. By focusing on this pathology in only a few centres, the patients would receive better and more timely treatment, and young surgeons could benefit from a proper training.