REFLECTIONS ON PHYSIOLOGY AND SURGERY

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A well-known Czech scientist Jan Evangelista Purkyne (1787-1869) laid the foundations of complex understanding of science and close connections of physiology with other medical fields, especially on the basis of experiments on animals.

A person must be healthy, strong and wise to enjoy his being as well as treasures of nature or nurture. A physiologist is committed to teach people not only how to think, feel. Physiology must provide at the same time firm foundations for psychology. Human physiology gained gradually a leading position among theoretical medical sciences and became a necessary and fixed basic science on which modern medicine developed. Also surgery which at its beginning operated without any physiological knowledge has been lately drawing more and more new lessons from physiology. In accordance with them and with their significant assistance, surgical methods and procedures are innovated to reach a minimum impairment of human physiology. It was physiology that set and has been setting limits for a surgeon how far he can go in his progress. These findings made it possible to draft a number of new surgical proceedings and resulted in a whole set of additional branches of surgery. Physiology helps medicine to distinguish the line between health and illness, it elaborates a whole set of examination methods, investigates systematically the environmental influences on human organism and by that it starts the development of preventive medicine.

The alleged antagonism of these two scientific branches, namely surgery and physiology, is only illusory. The latter carefully investigates integrity of organism from
the point of its functions, the former infringes on this integrity by external or internal interventions and always, even if temporary, changes the function or suspends it for a limited time or discontinues for a long time.

The purpose of a surgeon’s activity is not only the improvement of a patient’s health status, frequently by removing a part or the whole of damaged organ, but also a quick and complete restoration so the organism, incapacitated by disease, may function and return to the patient’s normal psychic state.

Contemporary surgery does not operate only on pathologically modified organs or those afflicted by pathological dysfunction but it also makes full use of physiological knowledge of the target organ and by doing so substitutes a frequently mutilating intervention on it (vagotomy).

The functional points of view are the most important ones in the evaluation of the surgeon’s endeavors. Reconstructive surgery gets on ever more quickly and convincingly to the leading place of scheduled operations and performances.

At the beginning of the 20th century, a surgeon’s relation to a tissue provoked a demand for physiological operations. In our country, this line was put through as early as in the thirties and forties by Burian as well as by Divis, Jirasek et al. The relation to an irreversibly damaged organ created conditions for developing transplantology. The more profound and exact information about the new methods of microsurgery were applied.

Without them it is not possible to imagine the current performance of microsurgery and replantation, e.g. in case of loss of extremities, or as the case might be their peripheral parts, and the development of vascular or neuromicrosurgery.

In our country, physiologic thinking was implemented in development of surgery by building special surgical centers, in the absence of which it would not have been possible to imagine specialized cardiosurgical or transplantation centers, thoracosurgical or traumatologic institutes, oncologic and oncosurgical centers for burns, centers for treatment of patients in critical state and specialized centers, as e.g. for the treatment of imminent life threatening conditions. First of all for a suffering man, the most important problem is to relieve the pain. In all branches of medicine, therefore, also in surgery, a multitude of operation proceedings have been developed on how to influence a certain
kind of pain or to eliminate it. In a similar way a number of new pharmacologic procedures have been innovated.

In the past ten years physiologic thinking has manifested itself in enormous development of endoscopic operations. History of surgery, as history of each human work, is a manifestation of respect for this work and an example for next followers.

In connection with it there is a question about mutual effects of different branches and especially the effect of physiology on surgery with feedback on this functional branch. The character of surgical therapeutic methods led physiologists to a deeper understanding of many processes in their whole dynamics for both the experience from operation findings and also the way of functional examination before the operation and its evaluation.

Even if the theory of origin, substance, course and diagnosis as well as therapy of the whole number of illnesses belonging to activity sphere of surgery and internal diseases are the same, the practice itself caused that both branches are frequently working on the same queries and problems in research and in therapy separately and differently. At the same time clinical physiology can participate in close coordination and cooperation so as it is demanded on the other hand by practice at the patient’s bed or even in the operation theater, i.e. with the cooperation of all the experts, internists, surgeons, clinical physiologists and other interdisciplinary works.

Further, it is necessary to remember that physiology and surgery can significantly participate in examination and research methods because surgery develops more operation methods and to a lesser degree new ways of examination.

The technical nature of basic surgical therapeutic methodology elaborates all aspects of our knowledge of diseases because the operation substitutes sometimes the task of clinical experiments after a previous experiment on animals. It can be understood that surgery as well as many other branches of science, use basic experimental operations on animals for amplifying its theoretical aspects of knowledge and verification of its new operation techniques that proceed regularly. In this respect surgery and physiology are very similar in their experimental activities. In the same manner, even is the necessity of team cooperation in surgery with team character in theoretical and practical activities, classical and demonstrative. Further, it is a prospect for the future when during operations
increasingly more and more numerous teams of the highly qualified experts of different branches including clinical physiologists, clinical pharmacologists, immunologists and others will participate. The success of operation will be influenced more and more by the quality of diagnosis made before operation, by continued, systematic and complex care for patient before, during and after the operation, by quality of technical equipment of the institute, by quality of team workers and by cooperation of all institution and extraintitutional experts.

It is also necessary to enlarge and to intensify persistent cooperation between physiologists and clinicians not only in this way the aim that is physiology as science and medicine as applied science can be reached most quickly and in the best way.

Surgical work and operation activity proved in an exemplary way the significance of proper organization, distribution and utilization of time, usefulness and tenacity of purpose in activity of the whole working team. There is a presupposition of such a mental, moral and physical ability of the surgeon that a disarranged style of life is not compatible with it but on the contrary, the physical ability and equalities of character cultivated by a live participation in social activities is asked for.

In summary, the relation of surgery to physiology as well as the other way round is functional, progressive and unquestionable. It brings benefits to the patient. The physician’s aim is not only to restore life and to hold it for a short time but to protect it and to bring it to an admirable height and beauty.

It secures mutual cooperation and coordination and in such a way it gives rise to organization of scientific disciplines that secure and become a condition of further development of branch by means of experiments on animals and by clinical experiment. The multidisciplinary orientation develops scientific thinking, new processes and functional methods. It enriches science.

The physiological thinking precedes new branches of surgery as reconstructive surgery, transplantation with microsurgery, surgery of pain and surgery in case of sudden menace of life and endoscopic surgery that has taken on broad advancement.

To be a scientist means to be a teacher of people. Maybe the purest thing about Man is his continuous effort towards more and more exact knowledge. Only in this manner does mankind seem to march to its greatness.