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DEAN MARK W. ALLAM LECTURE
W.W. ARMISTEAD
Guest Lecturer

VETERINARY SURGERY

Past, Present, Future

Veterinary surgery, like human surgery, is of ancient origin but of relatively recent development as a science. Early human surgery dealt mainly with trauma and, consequently, received its greatest developmental stimulus from war and other disasters.¹ Until the 14th century surgery was considered a trade and was controlled by "barber-surgeons" whom the universities did not recognize as part of the educated medical profession.

About 1350 the first step was taken to legitimize surgery. The College of St. Come opened in Paris and its members came to be known as the "surgeons of the long robe." The old barber-surgeons, presumably less well prepared, were referred to as the "surgeons of the short robe." Then in 1540 in London the surgeons and the barbers formed an alliance called the United Company of Barbers and Surgeons. Under this arrangement the surgeons performed the surgery while the barbers were relegated to tonsorial duties and phlebotomies.²

The period in history at which surgery changed from a trade to a medical science corresponds to the lifetime of John Hunter (1728-1793) who is credited with founding surgical and experimental pathology.³ The century following Hunter's death produced three great discoveries which became the cornerstones of modern surgery: anesthesia, asepsis, and the X-ray. So by the latter part of the nineteenth century human surgery had come of age as a recognized branch of medical science.

Meanwhile veterinary surgery had not fared so well. Veterinarians were slow to adopt the improvements being pioneered in human surgery, preferring instead to perpetuate the crude methods of an earlier day. Until the 1920's veterinary surgery consisted mainly of spaying, castration, dentistry, and the repair of traumatic wounds. Surgical invasion of certain areas of the body, such as peritoneal and joint cavities, was thought to be too hazardous to be acceptable in general practice. As late as the 1930's most veterinary surgeons operated bare-handed, even in posh small animal hospitals and in college veterinary clinics. Aseptic technic did not come to large animal surgery until after World War II.

Of course, since World War II the development of veterinary surgery has been dramatic. In the short space of 25 years, veterinary surgery has achieved a level of sophistication equivalent in most ways to that of human surgery. In fact, because of the increasingly important role of veterinarians in basic medical research, veterinary surgeons are pioneering many of the surgical advancements to be used in human surgery.

HOW SURGERY ACHIEVED PRESTIGE

In the early days of medicine anatomy was the only exact medical science. Physiology and pathology were only dimly understood. Microbiology was almost completely unknown until the 1860's. And the clinical areas of medicine were more art than science until well into the twentieth century. During most of medicine's long history, diagnosis was largely intuitive and treatment was nonspecific, symptomatic, and highly empirical.

In these circumstances it is easy to understand why anatomy very early captured a lion's share of the medical school curriculum. It is so much easier to teach and to learn what one can see and touch! It is so much more comfortable to teach, and so much easier to learn, facts than theories. And almost from the beginning anatomy consisted of a body of unassailable facts. A movement is under way now to decrease the number of formal credits allocated to anatomy in the medical curriculum. Of course the loss may be more apparent than real since the student's knowledge of anatomy is reinforced repeatedly in later courses. As surgery becomes more sophisticated, a detailed knowledge of anatomy becomes more important. And, of course, anatomical detail can be more easily learned and remembered if it is taught in connection with applied subjects such as surgery.

Until quite recently most physiology was theory, most diagnosis was opinion, and most medical treatment was ineffective. In fact, one writer has noted that "the year 1910 was a crucial one in human history because this was the year when the medical profession began to do more good than harm."⁴

Until the twentieth century, medical cures depended heavily upon Lady Luck, Mother Nature, Father Time, and the inherent toughness of the unfortunate patient's constitution. Not until the advent of the sulfonamides in the 1930's was there a significant body of effective, specific medical treatments for infectious diseases.

Surgery, on the other hand, always has been a highly specific form of therapy. The victim of a surgical disease was not merely treated for it; usually he was physically separated from it. Moreover, he was separated from his diseased part in extremely dramatic circumstances — and the results of the surgery often were known almost immediately. Typically, surgical patients were dead or well in a few days whereas seriously ill medical patients often languished for weeks before dying or slowly recovering. The medical practitioner, working quietly in the home or office, prescribed pills or applied external medications while the surgeon, in the theatrical spotlight of a bustling operating room, boldly entered the patient's body and rearranged his vital organs.

Still, until recently, operations with poor probability of success simply were not attempted. At the same time that surgeons were thus hedging their bets, medical men were treating every hopeless patient with something — thus assuring themselves of a high rate of failure.

Small wonder then that in the eyes of the general public the surgeon should have achieved a personal glamor and social influence far beyond that of the medical practitioner. Small wonder also that the most glamorous of surgeons in the public eye should be the brain surgeon who delves into man's most intricate and sensitive private part.

Paradoxically, the surgeon does not carry quite the same degree of prestige on the campus as off. Some of his university colleagues still view him as more a skilled artisan than an academic scientist — a characterization which these days may owe more to professional jealousy than to scholarly merit.

THE EMERGENCE OF MODERN VETERINARY SURGERY

There is a curious inconsistency about the way professional images are built. To most of the general public, the veterinary medical profession is exemplified by private practitioners with whom the public comes into daily contact. Yet when the profession wishes to justify its existence to governmental agencies and to the human medical profession, it emphasizes instead veterinary medicine's contributions in the fields of research, regulatory medicine and public health.

Similarly, it is those concerned with animal diseases who build the reputation of the veterinary profession at large. But it is in surgery that most of the individual reputations of American veterinarians have been made. Perusal of a list of outstanding twentieth century veterinarians will reveal that most of them are considered to be primarily surgeons. In the early part of the century these were men like Bemis, Merillat, Lacroix, Frank, Guard, Fowler, Schroeder, Farquharson, Stader, and Leonard. Later there appeared such contemporary names as Brinker, Archibald, Rudy, Jenny, Allam, Blakely, Hoerlein, Lumb, Schiller, Magrane, Churchill, Annis, Brasmer, Leighton, and many others. In fact, the roster of members of The American College of Veterinary Surgeons reads very much like a Who's Who in the veterinary medical profession.

Like any other new science, early veterinary surgery encompassed more than it now wishes to claim. Included at first were not only such legitimate professional activities as obstetrics, dentistry, radiology, and anesthesiology, but also some of questionable scientific standing such as shoeing, firing, and tail-setting of horses, as well as some that clearly are only farm skills such as calf de-horning, lamb docking, and hoof trimming. As surgery became more scientific, many of the activities just mentioned either were split off into separate specialties or were dropped altogether. As a result, veterinary surgery has been freed to concentrate in depth on those areas which are central to its interest and purpose.

With the growing sophistication of veterinary surgery some time-honored devices and practices have been abandoned. Phlebotomy, evidently appropriated from human surgery, has long since disappeared from the veterinary surgeon's armamentarium. Certain devices which appear to have been veterinary inventions — firing irons, wound drains made of garden hose, and iodoform setons — also seem to have disappeared. Radiology and anesthesiology are becoming specialties administratively independent of surgery.

With veterinary surgery itself, subspecialties are developing. The oldest and most vigorous of these appears to be orthopedic surgery, perhaps because of the early stimulus it received from an increasing number of automobile-induced injuries. Cardiovascular surgery and ophthalmic surgery also are developing rapidly now.

Enormous growth has occurred in experimental surgery on animals. Of course most of this in the past was done by M.D.'s rather than D.V.M.'s. But surgery of animals is veterinary surgery, regardless of who performs the operation, just as diseases of

animals are veterinary diseases, regardless of who administers the treatment. Moreover, it appears that an increasing percentage of experimental surgery is being done by, or with the assistance of, veterinarians. The results of such surgical research are likely to accrue to the benefit of both animals and man, regardless of the primary objective of the researcher.

The distribution of effort among species in veterinary surgery also has changed radically in the past two or three decades. Surgery of dogs and cats has increased enormously, while surgery of farm livestock has declined. Equine surgery, the backbone of the profession until World War I, fell into a rapid decline thereafter. Then, in the 1960's, popularity of the horse began to grow rapidly — this time as a companion and pet rather than as an economic unit on the farm. As a result, equine surgery once again is a major subject in the veterinary college curriculum and a growing element of many private practices.

It is obvious that these shifts in species emphasis are the result mainly of economic influences. Surgery on cattle, sheep, or swine is undertaken today only if it can produce a profit for the owner. With horses, dogs, cats, and other pets it is sentiment rather than intrinsic value that determines if surgery can be undertaken and sets the limit on what kind of surgery can be performed. And the American public is notoriously sentimental about its pets — a fact that the humane associations have exploited most effectively in the past decade or two.

THE RELATIONSHIP OF VETERINARY SURGERY TO HUMAN SURGERY

There is a long-held folk belief that animals heal more rapidly than does man. This idea arose in the days when human patients were required to remain abed for long periods after major surgery. Following the enforced inactivity of extended "bed rest" the human patient was so weakened that recuperation was unnaturally prolonged. Animals, on the other hand, were allowed to regain their feet and to take moderate exercise immediately after surgery. Evidence now supports the contention that early ambulation speeds healing. Animals always have exercised earlier, not because faster healing permitted them to exercise sooner, but because they could not be made to rest.

There is research evidence to suggest that fibroplasia proceeds at the same rate in all species.⁵ Thus any apparent healing advantage the animal may have over man must be due to factors

other than an intrinsic ability of animal tissue to heal more rapidly. In small animals, particularly in orthopedic surgery, it may also be a function of size. Through natural exposure, the animal patient may have become more resistant to wound pathogens. The animal also may show less objective evidence of postoperative pain and weakness. And he most certainly has fewer psychological problems, such as apprehension about the outcome of his illness. All these are factors which may affect recovery from major surgery.

But the major factor may be early postoperative activity, a principle which has been widely accepted by M.D.'s only during the past decade or so. However not all human surgeons have been so slow to advocate early ambulation, as the following quotation indicates.

"Operations of such magnitude that the recovery of the patient is doubtful, show the most gratifying results and the most astonishing rapidity in convalescence, if the patients are got out of bed within 24 to 48 hours. The early mobility induces better assimilation of food and makes circulatory disturbances less likely; hence, there is less danger of pulmonary complications, which latter are of particular significance in the case of patients advanced in years."

Those remarks were made before the American Gynecological Society by a New York physician named H.J. Boldt on May 8, 1907!⁶ Yet half a century passed before his advice was widely adopted by human surgeons.

WHERE ARE WE GOING?

It seems safe to predict that veterinary surgery will become rapidly more sophisticated in the decade just ahead. While academic surgeons continue to probe new frontiers, private practitioners will offer their clients ever higher standards of surgical capabilities and performance.

Small animal surgery will continue to set the pace in the 1970's. But equine surgery, spurred by the remarkable new role and popularity of the horse, will become very rapidly more sophisticated.

Farm animal surgery, because of economic limitations, will continue to decline in importance. However, for the occasional, very valuable animal, technics and expertise developed on other species will be available for adaptation to livestock species. Thus, while the volume of farm animal surgery certainly will decrease, the quality will increase as a function of the general advancement of veterinary surgery.

Surgery will draw the M.D. and the D.V.M. together more forcibly than ever in the 1970's. Again, orthopedic surgery has led the way in a mutually beneficial collaboration. Contributions of Stader, Gorman, and others to the solution of difficult human fracture problems by now is legend. But the increasing volume of medical research and the vastly improved surgical competence of veterinarians will make future collaboration even more likely, if not essential.

Now that veterinary anesthesiology is a well defined specialty, those who do research involving surgery on animals will require the collaboration of veterinary anesthesiologists, the more urgently as the sophistication of their research increases. Nor can M.D.-researchers be expected to know as intimately as does the D.V.M. the many species of animals now being used in medical research. In fact, the emergence in the 1960's of the animal-models concept of research on human problems seems certain to expand further in the 1970's, encompassing an ever greater number of sub-human species.

A particularly powerful force in bringing together M.D.'s and D.V.M.'s will be the further development of transplantation research. This area seems to call naturally for collaborative effort because, in addition to surgeons, it requires biochemists, pharmacologists, and immunologists. At Michigan State University the first step in such a development has been taken by establishing a surgical research laboratory to be jointly administered and financed by the College of Human Medicine and the College of Veterinary Medicine. Coordinator of the laboratory, which will be located in the veterinary clinic building, will be a veterinarian who already holds a joint appointment in the two colleges.

For veterinary surgery itself, the future seems particularly bright. Great strides will be made, not only in surgical technics, but also in preoperative and postoperative care. Surgeons will draw increasingly — and with great profit — on the expertise of biochemists, hematologists, pharmacologists, and bioengineers.

Small animal surgery, which rivals human surgery in sophistication, actually may assume leadership over human surgery in some fields as a result of greater veterinary involvement in surgical research. Since surgical research animals often are of the same species as regular veterinary patients, technics developed in the surgery laboratory can be implemented quickly in private veterinary practice.

On the other hand, an unavoidable lag occurs in human surgery while technics developed on animals are adapted to human patients.

The area of surgical residencies will see further development in veterinary medicine in the 1970's. The American College of Veterinary Surgeons of course will be the power behind this movement. It is to be hoped, however, that the College will take steps to speed extension of the benefits of surgical specialization beyond academic clinicians and into private practice.

Another advancement which The American College of Veterinary Surgeons might promote is improvement of the surgical technics used in the basic science laboratories of both human and veterinary medical schools. Basic scientists, particularly those in human medical schools, tend to view research and teaching animals as articles of equipment or as expendable supplies. The results too often are exhibitions of callousness and inferior surgical technic which not only border on the inhumane but also provide for students an exceedingly poor introduction to the field of modern surgery.

CONCLUSION

Surgery is a skill. It is also an art with strong elements of engineering. But is mostly a science. Its scientific aspects will develop very rapidly in the 1970's. And in the broad field of surgery, animal surgery is where the frontiers will be attacked. Veterinary surgeons, if they are wise enough to capitalize on their opportunities, will lead the way.

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