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Review of SURGICAL LIMITS: THE LIFE OF GORDON MURRAY by Shelly McKellar

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Book Review
Critique de livre

SURGICAL LIMITS: THE LIFE OF GORDON MURRAY. Shelley McKellar. Toronto: University of Toronto Press; 2003. 270 pages. $48. ISBN 0-8-2—3739-9

Gordon Murray ranks as Canada's greatest surgical pioneer, to whom history has been most unkind. Shelley McKellar has written a surgical biography that goes a long way toward explaining how this came about, and gives us a good opportunity to reassess Murray's extraordinary career.

When Murray graduated from the University of Toronto in 1921, he apprenticed with a country surgeon, Dr. Lorne Robertson of Stratford. In the neighbouring town of Fergus, Dr. Abraham Groves was entering the last decade of an extravagantly long career in which he pioneered basics such as surgical asepsis and appendectomy. In light of Murray's subsequent achievements, it is remarkable that the overlapping careers of these surgeons from southwest Ontario spanned the entire gamut of modern surgical history.

After 18 months in Stratford, Murray undertook formal surgical training in London (England), New York and Toronto. In 1927, he was appointed to staff at the University of Toronto and the Toronto General Hospital. As a teacher of undergraduates, he was assigned a large range of basic medical topics. This may have given him the confidence to enter any area of medicine where he saw need and opportunity. From his rural experience of "making do" he brought an ability to innovate, to add to what he may have gained from watching the discovery of insulin: a desire for public success.

Murray immediately set about devising and inventing. From internal stenting of the malignant esophagus (1925) and bone autotransplantation for malunion of the scaphoid (1934) to a new method of abdominoperineal resection of the rectum (1932), his penchant for surgical research was quickly evident. Charles Best recruited his help in the development of heparin. A successful series of animal experiments and clinical trials established Murray as a leading academic cardiovascular surgeon. He pioneered the treatment of deep vein thrombosis and pulmonary embolism (1937), arterial embolectomy (1943), cardiac valve surgery (1938) and interventricular septal defect repair (1948). He was particularly adept at the Blalock–Taussig procedure, and his practice established Toronto as a centre for surgical treatment of congenital heart disease.

He used 2 models of thrombosis to test heparin: canine kidney autotransplantation to the neck and the passage of blood through tubes. The ability of heparin to prevent clotting in tubes led him to invent a dialysis machine in 1945. He was unaware of Willem Kolff, working in occupied Holland, who designed a dialysis machine in 1943. Kolff went to Boston after the war and is considered the inventor of dialysis, even though it is Murray's designs, not Kolff's more cumbersome approaches, on which today's dialysis methods are based.

Murray's experience with patients undergoing renal failure and with experimental transplantation caused him to undertake a logical series of animal experiments that in 1952 resulted in the first clinical trial of kidney transplantation from deceased donors. Again he was overshadowed by Boston, and today is not considered one of the pioneers of transplantation because (it is said) he had no understanding of transplant biology.

I have called McKellar's book a surgical biography because its careful discussion places these surgical developments in the context of the knowledge of the time. That it does so in a manner that will excite the lay reader as well as satisfy the experienced surgeon is a tribute to its author, Shelley McKellar, a historian at the University of Western Ontario. Particularly good is the description of Murray's later years, when failed therapies for cancer and a premature announcement of success regarding a method for surgical repair of injured spinal cord marred his reputation. The latter episode resulted in accusations of fraudulent surgery and Murray's retirement at the age of 75.

My principal criticism of this biography is a feeling throughout that knowledge of this late debacle taints the description of Murray's earlier life. The author transmits a sense of unease even when describing his successful life-saving innovations. For the sake of impartiality, the descriptions of these sometimes marvellous events are somewhat cold. Murray's own account, in his autobiography *Quest for Medicine* (Toronto: Ryerson Press; 1963), of correcting a ventricular septal defect in a young patient who had come all the way from New Zealand for care, is thrilling but compassionate in comparison with his biographer's version. To do nothing for patients whose death is certain without treatment is a far more reckless choice than to try a well-conceived if novel strategy. Murray worked in different times to our own but he lived by scruples, later formulated by Francis Moore, of introducing innovative surgery in a stepwise fashion after extensive laboratory testing.

The 50th anniversary of the report of the first series of kidney transplants is an opportune moment to review what Murray actually said and did. McKellar's biography is a very useful adjunct to such a study. In a series of well-thought-out animal experiments that he then applied clinically, Murray defined the important aspects of retrieval, storage and implantation that are still

used in organ transplant. This was at a time when competing teams such as that in Boston were attempting placement of the kidney in the thigh with a ureterostomy at the knee. In the animal experiments, Murray described the major types of rejection before they were known or named, and was the first to attempt immunosuppression by chemotherapy or total body irradiation. Dismissal of Murray as a maverick technician or failure to cite his transplant publications cannot be justified.

Murray's contributions to the development of surgery should not be forgotten. This is a thoughtful biography that surgeons and historians will find rewarding.

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Tibial plateau fractures

I read with interest Dr. Cameron's letter about tibial plateau fractures (*Can J Surg* 2004;47:149). This is the second time he has written on this subject, with the same conclusion that "tibial plateau fractures seldom progress to total knee replacement unless there are surgical complications."

Although Dr. Cameron refers to a large caseload (3000 cases), I am concerned that there may be a bias. Does Dr. Cameron treat tibial plateau fractures? Has he followed the results of those fractures to see how many have come to a joint replacement? If there are other surgeons in his institution who treat tibial plateau fractures, what are their results for subsequent incidence of total knee replacement? Were his patients carefully and *prospectively* asked if they had ever sustained knee trauma?

If Dr. Cameron does not treat tibial plateau fractures, is it possible that those patients with poor results have their joint replacements performed by the surgeons that treated the original presenting fracture?

It seems that this letter represents informal conclusions from an uncontrolled cohort without the benefit of peer review. Can it be misleading? Is it appropriate to publish?

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(Dr. Cameron replies)

Dr. Driedger is concerned that an uncontrolled cohort study may unintentionally produce bias. I too share his concern and believe that no cohort study provides an answer that could be regarded as being definitive.

To answer some of his specific concerns, only 1 of the "purely" trauma surgeons in my institution does total knee replacements, and the number he does in comparison to those by joint replacement subspecialists is very small, so that I do not think that this is a source of bias. All patients who are going to have joint replacement do have a history taken, and I doubt that a patient would forget having had a tibial plateau fracture.

I do treat tibial plateau fractures, but I do not follow trauma patients over prolonged periods. As it may take 40 years before osteoarthritis is of sufficient severity to require total knee replacement, such follow-up would be impractical. Even joint replacement patients, whom subspecialists try to see regularly, tend to become lost to follow-up once 10 or 15 years have passed since the index operation. Attempts to find trauma patients from chart review produce such huge losses to follow-up that the results of such studies would be largely meaningless.

I doubt that a couple of decades after the original injury, a patient who develops symptomatic osteoarthritis is likely to return to his or her initial trauma surgeon. It is more likely that such people would turn to a subspecialist joint replacement surgeon.

I am quite prepared to admit that numbers may be somewhat higher than my study suggested, but they still must be surprisingly low.

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