John Benjamin Murphy – Pioneer of gastrointestinal anastomosis

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Abstract Surgery as a speciality has reached an advanced refinement today both in terms of teaching and technique. With knowledge gained from years of research, teaching is now evidence-based. With the illuminating, pioneering work of a few great former surgeons, the technique of even complex surgical procedures has been well elucidated now. John Benjamin Murphy is one such surgeon to whom the speciality of surgery would remain perpetually indebted. His landmark achievements not only in gastroenterology but also in urology, orthopaedics, oncological and vascular surgery would leave even a hard-core critic marvelling at his genius. Above all, Murphy was a dedicated teacher who spent 4 days a week demonstrating procedures and lecturing interested surgeons. Herein lies the greatness of the man and a tribute highlighting his achievements are in order.

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"He made most simple subjects exciting and the most abstruse subjects clear"

– Sir Richman Godlee

John Benjamin Murphy (Fig. 1), regarded as 'Stormy Petrel of surgery', was a master surgeon, a superb clinician, a great teacher, a brilliant innovator and a prolific author. With his wide range of interests and accomplishments, Murphy was a pioneer in making surgery a speciality.

Born in 1857 in Appleton, Wisconsin in a log cabin, the son of poor Irish immigrants was youngest of 5 children. Education was extremely important for them initially and that was nurtured in them by their mother at that time. JB Murphy quoted his mother – 'If you are educated, there is no man's achievements which you cannot equal or excel pro-

Fig. 1 John Benjamin Murphy (1857–1916)

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vided you have industry and integrity and are temperate' [1]. JB Murphy dedicated himself to be a 'lifelong' teacher right from his early age. His professional life, however, was pure Chicagoan, the city in which he worked his way through Rush Medical College, interned at the Cook County Hospital, held professorships at 3 medical schools, and then was Chief of Surgery at Chicago's Mercy Hospital from 1895 until his death in 1916. He went to Vienna to work with Theodore Billroth in 1882. Leon Morgenstern from Cedars – Sinai Medical Centre, Los Angeles commented – 'American surgery had not seen, nor will it probably see again, a general surgeon of such diverse talents and prodigious productivity' [2].

Murphy's range of interest was simply astonishing. He recognised early the validity of asepsis, the value of diagnostic and therapeutic radiography, the benefit of arsenicals for syphilis and the importance of experimental research for the advancement of clinical surgery. He was the first to recognise the *Actinomyces hominis* infection in United States. He built a laboratory in his barn, where his wife assisted him by serving as technician and anaesthetist for the animals.

Murphy was considered an outstanding teacher of his era. Twice a week hundred of surgeons from United States and abroad crowded the amphitheatre where he operated and lectured. He once stated – 'The most valuable portion of my medical experience has been derived, I believe, from the fact that during all these years of practice, in spite of the most inconsiderable labour which it involves, I have not only seen, but also examined carefully, practically every patient on whom I am expected to operate. That is my system'.

Being a tall man with a parted red beard with flamboyant character and style and a curiously harsh and strident voice, a lavish office and his knack for placing himself in the public arena drew patients as well as criticism from all quarters. His outspoken views made him very close to news media which upset the local conservatives and older surgeons. An inveterate self publicist and social climber which according to Robert Goldwyn from Harvard Medical School, left his enemies more envious than offended and illustrates the truth of the Russian proverb – 'The dogs bark at the rider travelling the fastest' [3]. John B Murphy's personality can be judged from the fact that 'B' was not part of his given name. However John Murphy added the 'B' for Benjamin in his late teenage years – 'to give his name more weight'. His practice was enormous and on one occasion included President Theodore Roosevelt, whom he supposedly hijacked from other surgeons, after an assassin's bullet lodged in his chest wall, sparing the lung. In fairness to Murphy, Roosevelt, who heard of Murphy, requested that he be his primary physician. When Murphy asked Roosevelt about any fear he might have about his bullet wound, Roosevelt responded – 'I have hunted long enough, Doctor, to know that you cannot kill a Bull Moose with a shot gun'.

In gastroenterology, it was JB Murphy who insisted on

'early' elective appendectomy before perforation or rupture, in 1889. It was first met with incredulity and derision from his colleagues, however, his more than 200 successful appendectomies proved the critics wrong. He did much pioneering work on intestinal anastomosis including anastomosis of the gall bladder to the intestine. He developed and designed an 'anastomosis button' better known as 'Murphy button' for a suture less anastomosis of the gall bladder to the duodenum, which was his preferred treatment for acute cholecystitis, but it was equally suitable for intestinal anastomosis. At the age of 35, Murphy described his button, in his own words, – '..... would revolutionise intestinal surgery'. The two halves of the brass button, each about an inch in diameter, were inserted into the bowel to be anastomosed and held in place by purse string sutures. When snapped together, the anastomosis was accomplished. In his paper, published in 1892, entitled 'Cholecysto-intestinal, gastrointestinal and entero-intestinal anastomosis and approximation without sutures', Murphy commented – 'It takes about as long to describe the operation as to perform it. The time it took in the case of the first lady on whom I operated was 11 minutes, from entering of the peritoneal cavity until the closing of the same' [4]. He also made a startling bold but true admission – 'I decided to perform cholecystoenterostomy by my anastomosis button which I had used for the first time on a dog 6 days previous'. With such colourful, controversial and creative attitude, Murphy, by devising this button, was the creator/precursor of the modern end to end stapling instrument. After his description of the device with 3 favourable cases in 1892, it was the method of choice for such operations at the Mayo Clinic and elsewhere in US until the mid – 1930s.

In 1903, Murphy described a hypersensitivity elicited by deep palpation in the subcostal area when a patient with acute cholecystitis takes a deep breath – 'Murphy's sign'. Later on, it was correlated along with ultrasonography in which the ultrasound transducer can confirm that the gall bladder is being pushed when the patient experiences the pain and inspiratory arrest in cholecystitis – 'Sonographic Murphy's sign' [5]. This is probably the only eponymous Murphyism which has withstood the test of time even today.

The 'Murphy's punch' was a fist percussion blow over the kidney, denoting renal obstruction, renal infarction or renal inflammation when positive. The 'Murphy drip' was a proctoclysis of sodium and calcium chloride solution for hydration and electrolyte administration when oral intake was impossible in peritonitis. It was published by Murphy in the April 1909 issue of the Journal of the American Medical Association. Reviewing perforation peritonitis paper by Murphy, Burgess remarked – 'Of all Murphy's contribution to surgical progress, this recognition of the defensive and protective capabilities of the peritoneum, and the principle by which these can be aided and not hampered in their beneficial efforts, constitutes in my opinion, his supreme achievement' [6].

In 1896, JB Murphy was the first surgeon to resect and end to end anastomose a major lacerated femoral artery in a patient of gun shot wound. In his technique, he invaginated the intima outside the adventitia of the vessel. This resulted in a narrowing of the lumen and of the 13 cases, only 4 were successful. In 1909, he was also one of the first to perform femoral embolectomy. Murphy was a pioneer in the resection of cervical ribs for the treatment of thoracic outlet syndrome due to subclavian artery aneurysm.

Murphy promoted the treatment of pulmonary tuberculosis with the injection of nitrogen in the pleural cavity to compress the lung which he described as 'therapeutic pneumothorax'. He was first to do it under X ray control. A child he had been treating with tuberculosis died in a car accident and at autopsy he found that several tubercular cavities were healing on one side of the lung which was collapsed by the disease. Murphy undertook the management of empyema and lesions of the chest wall and also performed thoracoplasty procedures. Drop ether anaesthesia was used in all cases. He did not use closed water seal drainage of the chest. His developed several techniques, based on his laboratory experiment on dogs, that became the foundation of thoracic surgery in humans including (a) the use of 5th interspace as the best approach to the hilum of the lung, (b) covering the bronchial stump with surrounding tissue to prevent leak and (c) aspiration of the chest following pneumonectomy to stabilise the mediastinum [7].

In neurosurgery, Murphy contributed significantly by developing an operation for trigeminal neuralgia, treatment of meningitis by drainage of the cerebrospinal fluid and worked on the regeneration of severed peripheral nerves.

In oncoplastic surgery, Murphy was far ahead of his contemporaries in treating carcinoma breast. He left the pectoral muscle and did remove the fascia and axillary lymphatics. To reduce the resultant deformity, he turned flaps from the major pectoral muscle or from the latissimus dorsi or subscapular muscles. His interest in plastic surgery extended to devising flaps for reconstructing the face after ablation of cancer and for releasing burn scars of upper and lower extremities.

In orthopaedic surgery, Murphy published articles on the arthroplasties for the hip, knee, elbow, shoulder and wrist. He described the use of tension loops for fixation of olecranon fractures and he also developed an original operation for recurrent dislocation of glenohumeral joint [8]. He also pioneered bone grafting techniques and made inroads in the management and reconstruction of ankylosed joints. A common commercial steel instrument used for femoral head procedures goes by his name – 'Murphy – Lane bone skid'.

In urology, Murphy advocated the conservative treatment of tuberculosis of testicle and contributed in the treatment of urinary tract trauma. He was considered an innovator for surgical intervention in prostrate cancer. Murphy considered renal tuberculosis to be usually a blood borne

infection, the bacilli entering the blood, by way of lymph stream, from the primary focus in bronchial glands. He advocated injection of tuberculin in the early treatment of tuberculosis. Nevertheless, the subject of renal tuberculosis had a profound personal interest for Murphy, for in 1883, while a post graduate student in Vienna, he had a sharp attack of hematuria, which a Viennese professor ascribed to right renal tuberculosis.

Among other interests, Murphy is credited as the first surgeon to remove a fibroid during pregnancy. He was also among the first surgeons to demand a sponge count during surgery. He, however, refused to wear rubber gloves!

Working far beyond his era, Murphy practiced evidence based medicine. Among his other works, he introduced – a method of saline infusion per rectum for the treatment of peritonitis, pioneered the use of local anaesthesia in surgery of the lung and advocated the development of vaccines for infection.

In 1912, Murphy performed what is arguably the first biliary tract endoscopy. He inserted an 'electric' cystoscope into a cholecystostomy drainage tract. In his own words, – 'It showed that a small stone was present in the hour glass contraction zone, where the large stone had formerly been lodged. The cystoscope was pressed on this to the round ligament; a hook passed through the cystoscope to the stone. The stone was rotated and jammed against the edge of the cystoscope, and by this means it was extracted from its position. The drainage was removed at the end of 5 weeks. The gall bladder mucosa had resumed a smooth, glistening appearance, in contrast to the trachomatous appearance which had been present at the time of operation. The smooth condition of the gall bladder is our guide in removing the drainage tube' [2].

One of the most remarkable operations of Murphy was the manufacture of a new jaw for a girl in Chicago, suffering from sarcoma. On his death, the *New York Times* described in their obituary that - 'Murphy constructed a jaw of heavy silver wire, with metal frame and it was placed after removal of the lower jaw, and sewed there. The flesh was quilted through the wire frame and the mucous membrane was sutured down on top of the tissue and the skin closed over the whole. The result was that the new jaw worked as well as the old, and the only mark of the operation was a slight scar, which was invisible except on examination' [9].

Murphy's relationship with colleagues and peers ranged from bitter acrimony to prestigious accolades. He was accused of stealing patients from other surgeons in the earlier part of his career. He, also, was initially refused membership in the Chicago Medical Society and American Surgical Association. Later, however, he became the President of the Chicago Medical Society, President of the American Medical Association, and a belated member of the American Surgical Association. He was the founder member of the American College of Surgeons. His biographer, Loyal Davis remarked – 'Imagination is one of the qualities that

raises a surgeon above mediocrity. An urge to reach new levels of care combined with personal and professional honesty, unselfishness, judgement and industry. His articulation of ideas moved us all to a new level. So much of our current practice is based on Murphy's work' [1]. Being a born teacher, in 1901, wrote the first 'Yearbook of Surgery', which continues to be published annually even today. Besides articles in textbooks and Yearbook of general surgery, Murphy published 66 papers in various medical and surgical journals. In 1904, along with Franklin H Martin, he launched a journal 'Surgery, Gynaecology and Obstetrics' and it was the first journal of its kind to have a surgeon as editor. It later became the 'Journal of the American College of Surgeons'. His weekly clinical demonstrations and lectures during operations were transcribed by a secretary, and published as 'Surgical Clinics of John B Murphy' which eventually after his death became 'Surgical Clinics of North America'.

A H Burgess from Manchester while delivering the John B Murphy oration said – 'In this era of increasing specialism, it seems incredible that, within such recent times, any single individual could have written with such intense originality and authority upon so many and such diverse branches of the surgical art' [6]. WJ Mayo commented aptly – 'We must remember the number of targets at which he shot, and that he always rang the bell'.

For years Murphy ran teaching clinics 4 days a week at Mercy Hospital, Chicago where he demonstrated to 150 visitors a day the various approaches to multiple surgical problems. George Crile said of him – 'He taught the nurse, he taught the medical student, he taught the intern, he taught the young physicians, he taught the veteran, he taught the laboratory worker, he taught the young surgeon, he taught the master surgeon, he taught the teachers of surgery, he taught us by example of his earnest intensive labour on behalf of his most humble patient, he taught by conferences, by lucid clinical demonstrations, he vitalised dull statistics with masterful logic, he wove and epitomised masses of evidence into convincing arguments and drew sound conclusions' [10].

The irony was as compared to his contemporaries like William Halsted of John Hopkins Medical School, Murphy left no lasting legacy of student disciples to carry his techniques forward. The doctors Mayo, Crile and Cushing were his friends and admirers later on. According to Goldwyn, – 'his life was a combination of a Horatio Alger story and Theodore Dreiser novel' [3].

The gavel of the President of the Pacific Coast Surgical Association (PCSA) is called as 'Murphy gavel' in honour

of JB Murphy because it is made from the Murphy house in Chicago. When the house, which was owned for years by the American College of Surgeons, was being dismantled, some of its wood was salvaged by Dr. Wiley Barker and crafted in the PCSA gavel [11].

Murphy died of heart disease at Mackinac Island, Michigan after having been ill for 6 months, in 1916, at the age of 59 years. After he suffered from angina pectoris for several years, his death was attributed to aortitis. Two days prior to his death, he correctly predicted the finding of his own autopsy, which he himself requested – 'I think the necropsy will show plaques in my aorta'. His right kidney was found to be extremely small, with extensive cicatricial changes; no giant cell were discovered macroscopically, and, the opinion formed was that the condition represented a chronic persistent infection.

On Murphy's death, William Mayo paid rich tribute by describing him as 'the surgical genius of our generation'. Morgenstern commented aptly – 'John B Murphy was one of the last frontiersmen of clinical surgery. The time today precludes the emergence of another John B Murphy' [12].

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