

Commentary**EMIL THEODORE KOCHER AND SURGICAL EPONYMS; A STORY OF DILIGENCE, HARD WORK AND EXCELLENCE****Koroye OF^{1*}, Baribote O¹**¹Department of Surgery, Niger Delta University Teaching Hospital, Okolobiri, Bayelsa State, Nigeria.***Correspondence:** Dr. Koroye OF; +234 803 708 7725; oyintonbrak@yahoo.com**Cite this article:** Koroye OF, Baribote O. Emil Theodore Kocher and surgical eponyms; a story of diligence, hard work and excellence. Yen Med J. 2021;3(1):3–7.**INTRODUCTION**

An eponym is the name of an object or activity that is also the name of the person who first produced the object or did the activity.¹ It refers to a person, place, or thing after whom or which someone or something is, or is believed to be named.² The art and science of Medicine and Surgery abounds with numerous eponyms. From the Polish pathologist Adamkiewicz to the Hungarian anatomist Zuckerkandl, in alphabetical order, there are hundreds of such eponyms. Emil Theodor Kocher is arguably the surgeon with the greatest number of eponyms.

It is not uncommon for a surgeon to say to the scrub nurse during surgery, “Give me a Kocher’s” or a Consultant telling a resident, “next we will Kocherise the duodenum”. Often times, the student or resident is oblivious of the name behind the instrument or procedure, or the person behind the name. This surgical historical review attempts to discuss the contributions of Emil Theodore Kocher to the field of medicine and surgery and highlight the surgical eponyms associated with him.

EARLY LIFE

Kocher was born on August 25th 1841 to Jakob A. Kocher, a successful railway engineer, and Maria Kocher who was a deeply religious woman.³ He was the second of six children. He obtained the Swiss Matura in 1865 and qualified as a doctor in 1869. He moved with his teacher to Zurich where he met Theodore Bilroth who had a great influence on his career. Bilroth is remembered for his work in surgery for gastric cancer.⁴ In his insatiable quest for knowledge, Kocher travelled through Europe and met most of the successful surgeons in that era. This was

facilitated by his fluency in English, French and German languages.⁵

In Berlin he met Langenbeck and Virchow and in Glasgow he worked with Joseph Lister. The Langenbeck retractor and the Virchow’s node (enlarged left supraclavicular node due to advanced malignancy) are eponyms which prove these men were master surgeons of their time. In his sojourn, Kocher also spent time with Nelaton and Louis Pasteur in Paris. He married Marie Witschi-Courant and they had three sons.

THE NOBEL PRIZE

The Nobel prize is another world-famous eponym named after Alfred Nobel.⁶ Nobel was the inventor of the explosive material, trinitrotoluene (TNT) from which he made a fortune. After being heavily criticised for making money from such a destructive invention, he started the Nobel prize foundation as a way of giving back to mankind.⁷

Emil Theodore Kocher was awarded the Nobel prize for Physiology and Medicine in 1909, the first surgeon and the first Swiss to do so since inception of the award in 1901.^{3, 5} This is one of the famous quotes of Kocher’s Nobel lecture, “it has become possible within less than half a century to expose all the organs of the body, the brain and heart not excluded, without danger and carry out the necessary surgical procedures on them”.⁸ This highly revered award helped in no small way in projecting the image of surgery as a gentleman’s profession and a highly prestigious craft. Around this period surgeons were called barbers and were ostracised from the noble profession of

medicine. Surgeons were relegated to performing procedures of broken bones, excising soft tissue lesions and tumours and draining abscesses. They were generally considered inferior to physicians.⁸ This ground breaking feat heralded the beginning of the surgeon being a University-trained medical doctor. Many other surgeons have won the Nobel prize and are referred to as “Nobel Laureate Surgeons”.⁹ They include:

1. Alvar Gulstrand in 1911 for work on dioptrics of the eye.
2. Alexis Carrel in 1912 for work on vascular anastomosis and organ transplant
3. Robert Barany in 1914 for work on the vestibular system
4. Frederick Banting in 1923 for the discovery of insulin.
5. Walter Hess in 1949 for his work on the midbrain function
6. Werner Frossman in 1956 for his work on cardiac catheterisation.
7. Charles Huggins in 1966 for his work on hormones and prostate cancer.
8. Joseph Murray in 1990 for his work on organ transplantation.⁹

FATHER OF THYROID SURGERY

Dr Kocher won the Nobel prize in 1909 for his extensive work on the pathology, physiology and surgery on the Thyroid gland.¹⁰ Goitres (enlargement of the thyroid gland) were common in the mountainous areas of Switzerland due to what is now known to be Iodine deficiency.^{3,5} This was before the routine, widespread use of iodised salt. The prevalence of goitres in his environment interested Kocher.³ At that time the function of the thyroid gland was unknown and thought to be for beautification of the neck.¹⁰ **Error! Bookmark not defined.** Goitres were left alone unless there was complicating respiratory obstruction. Surgery for goitres at that time had a very high mortality rate, the causes of death being severe haemorrhage and sepsis.^{5,10} An

American surgeon, Samuel Gross in 1866 summed up the ordeal of performing a thyroidectomy at the time; “If a surgeon will be so adventurous, or fool hardy, as to undertake the enterprise, I shall not envy him.... Every step he takes will be environed with difficulty, every stroke of his knife will be followed by a torrent of blood, and lucky will it be for him if his victim lives long enough to enable him to finish his horrid butchery”.¹⁰ Systematically improving on the surgical technique of Billoth and imbibing the impeccable, thorough aseptic measures of Lister, whom he acknowledged in his Nobel Lecture;¹¹ Kocher perfected the operative technique for thyroidectomy. The arteries and veins were ligated before excision of the gland and the recurrent laryngeal nerve and the parathyroid glands were preserved. This procedure endures till date. A clue to the function of the thyroid gland was seen in some of his thyroidectomised patients in whom he noticed symptoms of sluggishness, fatigue, mental retardation and weight gain which he termed “Cachexia strumipriva”, what is known today as Myxedema.^{5,10,12,13} This was corroborated by the findings presented by 2 surgeons in Geneva.⁵ To circumvent this Hypothyroidism, he devised the technique of subtotal thyroidectomy in which a cuff of thyroid tissue is left behind, thus replacing a radical surgery with a physiologic one.¹³

His work formed the basis for the subsequent isolation of thyroxine by Kendall in 1914 and its synthesis by Harrington 12 years later. Kocher performed over 7000 thyroidectomies with a mortality rate of less than 1%⁵ which is remarkable even in present times. He has dozens of publications on the thyroid gland.

KOCHER'S EPONYMS

KOCHER'S NECK INCISION: this is a gently curved, transversely oriented, skin crease incision placed 2 to 3cm above the suprasternal notch as against the disfiguring vertical incision that was used at the time of Kocher. It is used for access to the thyroid gland for the various types of thyroidectomies. The cosmetic outcomes are very good.

KOCHER'S SUBCOSTAL INCISION: this is an oblique, right subcostal incision made a finger breadth below and parallel to the costal margin. It extends from the

midline to the linea semilunaris, the lateral edge of the rectus sheath.¹⁴ The seventh, eighth subcostal nerves are divided. It is particularly useful for patients with wide, obtuse subcostal angles.¹⁴ It provides good exposure for liver, gall bladder and biliary tract surgery. Its use is also feasible in a right hemicolectomy.¹⁵

KOCHER'S ARC INCISION: this is an oblique incision for opening the knee joint.¹⁶

KOCHER'S VEIN: this is the posterior external jugular vein which originates in the occipital region and is a tributary of the common facial vein.^{17, 18} It runs obliquely down the anterior border of the sternocleidomastoid to drain into the internal jugular, external jugular or brachiocephalic vein.¹⁸ This variant should be borne in mind during neck surgery.

KOCHER'S SIGN: this refers to a convulsive retraction of the upper eyelid following a sudden upward gaze. It is seen in patients with Basedow-Graves disease and leads to the typical starry gaze.^{16, 19}

KOCHER'S TEST: this test is positive when pressure on the lateral lobe of an enlarged thyroid gland causes stridor indicative of obstruction due to a "scabbard" trachea. A scabbard is the sheath in which a sword is kept which has a tapered lower end. Scabbard is used in his context to describe the trachea which is tapered due to obstruction from the goitre.

KOCHER'S THYROID DISSECTOR: this is a surgical instrument designed by Kocher which is used to secure and ligate the superior pedicle of the thyroid, containing the superior thyroid artery, during a thyroidectomy.²⁰⁻²² Its blunt tip which has an eye is insinuated under the superior thyroid pedicle and a suture is threaded through the eye like an aneurysm forceps. Three sutures are then ligated in continuity close to the gland.²²

KOCHER'S THYROID RETRACTOR: this is a hand-held retractor for retraction of the gland during thyroidectomy.²¹

KOCHER'S TRAUMATIC TISSUE HOLDING FORCEPS: this was designed by Kocher in 1882.⁵ It is

shaped like Spencer-Wells artery forceps but with a tooth at the tip. It is generally used in handling tough tissue for example the fascia during mass abdominal closure,²³ the menisci in knee surgery and the ribs during resection. It is also used to clamp the margins of the thyroid gland before excision²¹ and is also used in obstetrics for rupturing foetal membranes for the induction of labour.

KOCHERISATION OF THE DUODENUM: this is a procedure to expose the structures of the retroperitoneum behind the duodenum and pancreatic head.³ This is achieved by incising the peritoneum lateral to the second and third parts of the duodenum and then reflecting it, together with the head of the pancreas, medially.²⁴ This manoeuvre exposes the inferior vena cava between the renal artery and the coeliac axis. It is useful for access in vena caval and aortic injuries, duodenal, gastric, pancreatic and right renal surgery.²⁴ It is based on a sound embryologic and anatomic knowledge.³ It is a component of right medial visceral rotation known as the Cattel-Braasch manoeuvre.²⁴

KOCHER'S METHOD OF BOWEL ANASTOMOSIS: the popular, widely used, 2-layer, hand sewn method of bowel anastomosis was actually started by Kocher and popularised by Connel and Lember. This method consisted of an inner, all layers, continuous suture technique with catgut and an outer seromuscular suture with silk.²² This was before the widespread use of staplers in advanced countries and the emergence of the synthetic absorbable sutures like Vicryl.

KOCHER'S METHOD OF INGUINAL HERNIA REPAIR: a method of invagination for the radical operation of inguinal hernia.¹¹

KOCHER'S REFLEX: this is abdominal muscle contraction on moderate compression of the testis.¹¹ **Error! Bookmark not defined.**

KOCHER'S METHOD OF REDUCTION OF SHOULDER DISLOCATION: the principle behind this method was anatomical and functional study findings in the shoulder joint.³

KOCHER-LORENZ FRACTURE OF THE ELBOW: osteochondral fracture of the Capitellar.¹¹

KOCHER-DEBRE-SELEMAIGNE SYNDROME:

this is a rare syndrome of hypothyroidism associated with muscular pseudo-hypertrophy giving the impression of an “infant Hercules”.^{11,25} **Error! Bookmark not defined.**

KOCHER’S POINT: this is a common entry point for insertion of a cerebral intraventricular catheter for the process of draining cerebrospinal fluid from the ventricles. This point is located an inch from the midline, approximately 11 cm from the nasion. It is advised to stay in front of the coronal suture to avoid the motor area.²⁶

KOCHER’S METHOD of fixation of the uterus to the anterior abdominal wall.¹¹

Kocher also made significant contributions to knowledge in the areas of Osteomyelitis, Urology, Missile injuries and Shock. He also did work on the function of the brain and spinal cord and on intracranial pressure.^{11, 13}

LATER LIFE

Emil Theodore Kocher was noted to have no other hobbies apart from surgery.⁵ He was a deeply religious and a devoted family man. He assumed a very simple and humble mien and he was adored by his patients and colleagues.^{5, 10} Kocher was appointed Professor and Chair of Surgery in his hometown University of Berne, a position he held for 45 years.^{3, 5} He trained and mentored several surgeons like Caesar Roux who described the Roux-en-Y gastrojejunostomy, Fritz de Quervain and his son, Albert Kocher, who succeeded him at the Berne surgical clinic. He published hundreds of academic papers including his famous “Textbook of Operative Surgery” which is translated to 6 languages.^{5, 12} He passed on in 1917, aged 76, after performing a laparotomy for trauma on a patient just 4 days before.³

One of his proteges, Harvey Cushing, the illustrious American neurosurgeon wrote this eulogy in his honour; “A slight, spare man of personal neatness, of quick step and alert bearing, of unfailing courtesy and dignity, precise and scrupulous in all his dealings, professional, public and personal- a man to trust. From hard work and

responsibility surgeons are prone to burn themselves out comparatively young, but Kocher had been blessed with an unperturbability of spirit which enabled him to bear his professional labours, his years, and his honours with equal composure till the very end. The current of his long and active life was as steady, cool and uninterrupted as that of the Aare (river) encircling his beloved Berne”.¹⁰

Theodore Kocher donated his Nobel prize money to the establishment of a research institute.^{Error! Bookmark not defined.} He has a street and a park named after him and two statues in Berne.^{3, 11} His bust was also on a Swiss postal stamp of 1967, a collector’s item commemorating the 50th anniversary of his demise.

Emil Theodor Kocher was a committed, determined, focused and innovative master surgeon. His numerous eponyms are a testament of his diligence, hard work and excellence.

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