

University of Groningen

The origins and current applications of classic eponymous terms for pelvic and acetabular fractures

Somford, Matthijs P.; de Visser, Enrico; Ijpma, Frank F. A.

Published in:

Journal of trauma and acute care surgery

DOI:

[10.1097/TA.0000000000001380](https://doi.org/10.1097/TA.0000000000001380)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2017

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Somford, M. P., de Visser, E., & Ijpma, F. F. A. (2017). The origins and current applications of classic eponymous terms for pelvic and acetabular fractures: A historic review. *Journal of trauma and acute care surgery*, 82(4), 802-809. <https://doi.org/10.1097/TA.0000000000001380>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

The origins and current applications of classic eponymous terms for pelvic and acetabular fractures: A historic review

Matthijs P. Somford, MD, Enrico de Visser, MD, PhD, and Frank F.A. IJpma, MD, PhD,
Arnhem, The Netherlands

ABSTRACT: We present the historical background of 5 eponymous terms in pelvic and acetabular injury treatment. The eponymous terms Duverney fracture, Malgaigne fracture, Judet-Letournel classification, Kocher-Langenbeck approach and Stoppa approach are discussed. After presenting the original description by the coining author, a short biography of the author is given. For each eponymous term the current clinical implication is given and discussed afterwards. (*J Trauma Acute Care Surg.* 2017;82: 802–809. Copyright © 2017 Wolters Kluwer Health, Inc. All rights reserved.)

Pelvic and acetabular fractures have posed the treating doctors with challenges since the first written history. Allegedly Homer, the well-known Greek author of the *Iliad* and *Odyssey* who lived in the 8th century BC, described the first acetabular fracture in the fight between Aeneas and Diomedes during the Trojan war where the latter threw a huge rock against the trochanter of the former, resulting in a central dislocation of the femoral head.¹ In ancient times, injuries to the pelvis and acetabulum were often referred to as “hip dislocations,” regardless of any associated fractures, because it was almost impossible to diagnose a fracture in this region by clinical examination alone. Hippocrates, the father of medicine who lived from 460 to 377 BC, used various maneuvers and a traction table to reduce the hip and the possible associated fractures. However, pelvic and acetabular fracture recognition and stabilization was still in its early stages until the beginning of the 20th century.² Advances in medicine including the introduction of anesthesia by Morton in 1846, the founding of antisepsis by Pasteur and Lister in the 1870s, and the discovery of x-rays by Roentgen in 1896 paved the way for modern fracture management. The first attempts to treat pelvic and acetabular fractures operatively were performed at the beginning of the 20th century. The Belgian surgeon Albin Lambotte (1866–1955) was one of the first surgeons who operated on the pelvis at that time by performing cerclage wire for pubic symphysis disruption and sacral bars for sacroiliac (SI) joint dislocation. It was only from the 1960s that the surgical treatment of pelvic fractures became more and more popular. Over time many pioneering physicians have contributed to the knowledge about and the treatment possibilities for pelvic and acetabular fractures. Some of them still have their name attached to the terms that are connected to these types of injuries.

The aim of this article is to identify and discuss some eponymous terms related to fracture type, classification, and the operative approaches for pelvic and acetabular injuries (Fig. 1). The original sources, which could be associated with these eponymous terms, were traced and revisited. In order to learn about our predecessors who were concerned with pelvic surgery in the past, we conducted a concise historical search on each eponym. The Duverney and Malgaigne fractures of the pelvis are specific types of fractures that need their specific mending. From a historical perspective, the classification of Judet-Letournel was the main guide in understanding the fracture patterns and mechanisms. Finally to get to the region we are discussing the approaches as described by Kocher-Langenbeck or Stoppa are frequently used today. This article does not compromise all known approaches or fracture types but provides an insight in how the current knowledge of the fractures has evolved and which people contributed to the development of these classifications and fracture patterns.

DUVERNEY FRACTURE

A fracture of the iliac wing that does not involve the remainder of the pelvis is known as the Duverney fracture.³ The French physician Du Verney described this type of fracture over three centuries ago as follows: “While carrying an iron tire a laborer fell and during the fall the iron tire was broken. Afterwards the patient was unable to walk. He was unable to move his leg and hip, and he was not even able to urinate properly. No fractures were discovered at the hospital where he was brought at that time. The patient was wrapped in a sheep’s skin, which afforded little relief. Unfortunately, after four days the patient died and upon section a transverse fracture of the ilium could be observed and the pelvis was filled with pus.”^{3,4}

Joseph-Guichard Du Verney or Guichard Joseph Du Verney (August 5, 1648 to September 10, 1730) was born in the village Feurs in the Massif Central of southern France. His father was a local doctor. He studied medicine in Avignon for 5 years, starting at the age of 14, and in 1667 he moved to Paris.^{5,6} Soon after receiving his medical degree at the age of 19, he was appointed professor of anatomy and surgery at the king’s medical school by King Louis XIV. In 1680, he was named professor of anatomy at the Jardin du Roi, a position he held for 40 years. During his appointment, he made great efforts to advance the

Submitted: November 16, 2016, Revised: December 20, 2016, Accepted: December 20, 2016, Published online: January 17, 2017.

From the Department of Orthopedic Surgery (M.P.S., E.d.V.), Rijnstate Hospital, Arnhem; and Department of Trauma Surgery (F.F.A.I.), UMCG, Groningen, The Netherlands.

Address for reprints: Matthijs P. Somford, MD, Department of Orthopedic Surgery, Rijnstate Hospital, Wagnerlaan 55, 6815 AD Arnhem, The Netherlands; email: mp_somford@hotmail.com.

DOI: 10.1097/TA.0000000000001380

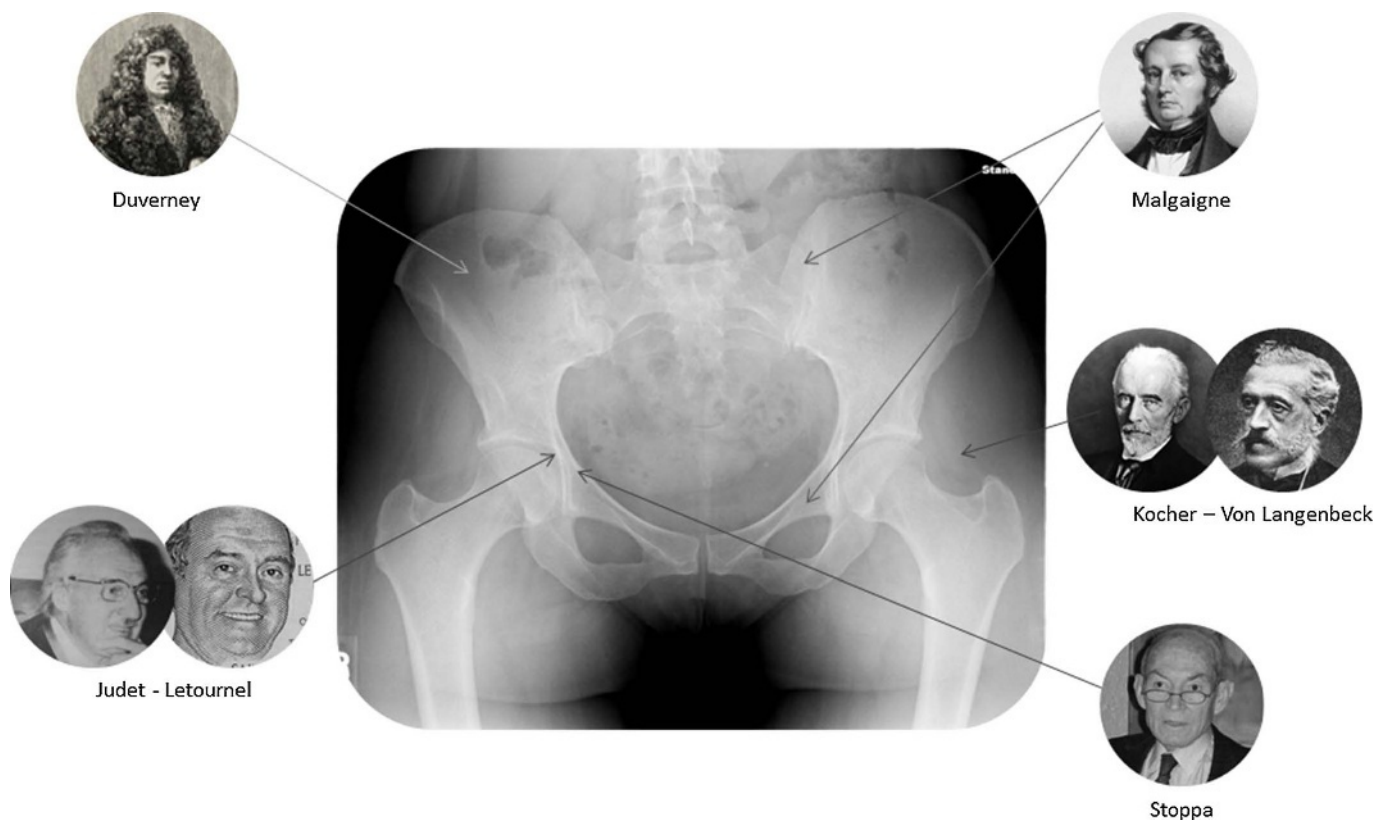


Figure 1. Overview of eponyms discussed.

knowledge of comparative anatomy. To do so, he performed anatomical dissections on specimens from the king's zoo. The anatomical demonstrations were open to the public, and members of the king's court attended these lessons on a regular basis.⁷ Twenty-one years after his death, a student of Du Verney named Senac collected Du Verney's notes and published them in the collected work entitled "Traite de Maladies des Os."^{3,6} This extensive two-volume work comprises many descriptions of fractures, dislocations, and bone diseases. This work contains the original description of a patient who suffered Du Verney's eponymous fracture and subsequently died of infection.^{3,6-8}

Clinical Implication

An extra articular fracture of the iliac wing (AO 61-A2.1) or the so-called Duverney fracture often does not need surgical intervention, unless there is a significant displacement or deformity of the pelvis. However, this type of injury can give rise to serious complications, as has been demonstrated in the first case that has ever been described by Du Verney. One should be aware of the possible accompanying injuries with this type of fracture. Perforation of the bowel leading to sepsis, internal iliac artery injury, and subsequent shock and nerve damage have been described and should be ruled out.^{9,10}

MALGAIGNE FRACTURE

A fracture of the inferior and superior rami of the pubis with a posterior fracture or dislocation behind the acetabular cavity is defined as a Malgaigne fracture.^{2,11} The posterior

disruption could involve the sacrum, ilium, or SI joint. The fragment can be caudally or cranially displaced (vertical shear fracture) or can have various inclinations. According to Malgaigne, the most frequent causes of these severe injuries were falling from height, crushing of the pelvis between two carriages, a wheel passing over the hip, and a kick of a horse. He refers to some pelvic specimens, stored in some museum collections, to explain the morphology and certain displacements of the "Malgaigne fracture." Making the right diagnosis solely based on clinical findings was challenging for him, because x-ray images were not yet available at that time. The first symptoms of these types of fractures were pain, contusion and swelling, and impairment or loss of motion in the lower extremity. At the physical examination, he measured the length of the limb and position of the iliac crest and tuber ischii to determine the extent of the injury. To ascertain the relations of the fracture fragments, he sometimes had to put one hand on the crista ilii, whereas the forefinger of the other passed into the vagina or rectum and presses upon the tuber ischii. If any displacement, such as overlapping of the posterior by the anterior fragment, was detected, he would attempt to correct it by manual reduction at the same time. At that time, these types of pelvic injuries were treated by traction for at least 45–50 days. Some kind of mechanical bed was sometimes used to bring the limb down to its normal length. To apply proper traction, the thighs were fastened together, the feet were fixed to the footboard, and the body was confined by a loop placed beneath the axillae. You can imagine that is was quite a challenge for Malgaigne to treat these severe pelvic fractures properly.



Figure 2. Joseph François Malgaigne (1806–1865), Fielding, HG. An introduction to the history of medicine: with medical chronology, bibliographic data, and test questions. London & Philadelphia, W.B. Saunders, 1914. (Public domain image).

Joseph Francois Malgaigne (February 14, 1806 to October 17, 1865) was born at Charmes-sur-Moselle, Vosges, France (Fig. 2). He was the son of a former army surgeon, who was a local health officer at that time. At the age of 15, he was sent to Nancy to study medicine. He qualified as a health officer at the age of 19 and went to Paris to continue his studies.¹² In 1830, the Polish revolted against the Russian control and Malgaigne drew together a volunteer hospital to accompany the Polish Army. From these efforts, he nurtured a lifelong dislike of the cold weather.^{12,13}

He was well informed about new developments in medicine. That way, he became the first one to use ether narcosis in France, only 3 months after the first success with this kind of anesthesia in Boston.¹² He often searched for primary sources in literature and read them in the original language, rather than relying on possibly faulty translations.

His most interesting influence on medicine in those days was that he criticized medical practice that was not supported by proper scientific research. One of his reviews included the statement, “The work of mister X contains many things both new and good. Unfortunately the good things are not new, and the new things are not good.”¹³

His most important works were the “Traite des Fractures et des Luxations” (1847), a two-volume work with an extensive

atlas that exceeded most of the previous discussions on the treatment of fractures.¹⁴ He described a specific type of pelvic fracture, an injury that came to bear his name, at chapter 15 (page 651) of his comprehensive work.^{11,15} Malgaigne defined the fracture as “a combination of two vertical fractures, separating one side of the pelvis.” He observed that, because of visceral injury, these severe pelvic fractures can become lethal. But “if life is preserved, lameness is very apt to ensue, or narrowing of the pelvis, the terrible consequences of which we have just seen.” With the latter, he refers to a case of a young woman dying 2 days after giving birth with a history of a healed Malgaigne fracture, which resulted in a fracture of the ischium after violent uterine contractions and delivery of the baby by means of forceps.¹⁵

Clinical Implication

Unstable pelvic ring fractures (AO 61-C1) or the so-called Malgaigne fractures need to be addressed by anatomic reduction and stable fixation of the posterior and anterior part of the pelvis. These types of injuries include unilateral complete posterior disruption through the ilium, SI joint, or sacrum. One or more associated anterior arch disruptions, such as pubis ramus fractures or pubic symphysis disruption, will also be present. The specific techniques of reduction and fixation will depend on the sites of injury, the fracture pattern and displacement, as well as patient factors and available resources. Regarding the posterior element of these injuries, pure SI joint injuries can be treated with percutaneous iliosacral screw fixation. If a closed reduction of the SI joint cannot be achieved, anterior SI joint plate fixation might be a suitable alternative. Regarding the anterior element of these injuries, pubic symphysis plate is indicated for symphyseal disruption and/or pubic body fractures. Pubic ramus fractures have several treatment options, including external fixation or pubic ramus screw and plate fixation. However, the most important lesson, already experienced by Malgaigne in the 19th century, is that these injuries can be lethal. Therefore, before we proceed with any definitive repairs, the patient must be fully resuscitated and fully evaluated.

JUDET-LETOURNEL CLASSIFICATION

The classification of Judet and Letournel was introduced in 1964 and is based on a landmark paper in the *Journal of Bone and Joint Surgery* about 173 patients with an acetabular fracture of which 129 were treated operatively.¹⁶ The reason to start operating on these types of fractures was the disappointing results of conservative treatment. The French physicians Robert Judet and Emile Letournel combined their findings during surgery with a radiological assessment of the fracture patterns to develop a classification system and propose some surgical approaches for these type injuries. The classification they formed with four elementary fracture patterns was applicable for 111 of the 173 cases. The remaining cases consisted of one of the elementary fracture patterns together with some additional fracture lines.¹⁶ The four elementary fractures include (1) fracture of the posterior lip, (2) fracture of the ilioischial column, (3) transverse fracture, and (4) fracture of the iliopubic column.

For assessment of these fractures, Judet developed an x-ray view, now known as the Judet view or obturator view.

Robert Judet (September 13, 1909 to December 20, 1980) was born in Paris as son of an orthopedic surgeon.¹⁷ He started working in general surgery but turned soon to orthopedic surgery like his father and elder brother. During the war, he was involved in the Resistance and even arrested by the Gestapo. He was fortunately released because of the lack of evidence of his clandestine activities. His exploit earned him, among other decorations, the medal Chevalier and Officier de la Légion de Honneur.^{17,18} In 1953, he was nominated for the first orthopedic teaching post in France. In 1956, he started as “chef de service” at the Hôpital Raymond-Poincaré in Garches. He held this position until his retirement.¹⁸ Judet was appointed professor of orthopedics and traumatology in 1963.¹⁸ With his brother^{19–22} and later on his son,^{23,24} he contributed to the development of total hip replacement. He was known for his energy and keen mind.

Émile Letournel (December 4, 1927 to August 16, 1994) was born on St. Pierre et Miquelon, a French island group in the St. Lawrence River off the coast of Newfoundland¹⁸ (Fig. 3). He obtained a scholarship at the French institute in London, which was temporarily moved to a location near Edinburgh because of the Second World War. After the war, he went to France and applied for a position in orthopedic surgery in 1960. He applied for a position with Professor Judet. He had no letters of recommendation, and the meeting with Judet was brief. At the meeting, Judet asked him where he came from, and Emile responded “St. Pierre et Miquelon.” Judet checked his agenda and offered Emile a 6-month residency the following year. The 6-month position was extended for another 6 months, and Emile subsequently became Judet’s assistant. Emile stayed with Robert Judet until his retirement in 1978.¹⁸

His thesis in 1961 contained the initial description of the classification system of acetabular fracture, developed by Robert Judet and himself, and was internationally accepted because of its clinical usefulness.^{25,26} On the basis of his own experience of over 1,000 operated fractures of the acetabulum, he developed a treatment algorithm for all the acetabular fracture types. His greatest pride and delight was to see the mastery of his techniques reproduced by his students. Professor Letournel never used a depth gauge. He would merely place his finger on the drill bit at the appropriate length of penetration to

measure the correct length of the screw.¹⁸ He believed that the only way to treat an acetabular fracture optimally is by perfect reduction, and he struggled with the fracture elements until he was satisfied with the result.^{18,25,26}

Clinical Implication

The Judet-Letournel classification remains an important tool for grading acetabular fractures, and it helps in optimizing the surgical planning and treatment. Even the rise of computed tomography (CT) has not changed the usefulness of this classification system.²⁷ The introduction of the CT scan has not changed the classification system of the fractures, but it does however replace the function of the traditional Judet views in some clinics.²⁸ There is a high interobserver reliability among surgeons treating acetabular fractures on a regular basis.²⁷ Although modification has been done to simplify the classification system, the foundation of acetabular classification according to the “four elementary fractures with possible additional fracture lines” should be attributed to the pioneering work of Judet and Letournel about half a century ago.²⁹

KOCHER-LANGENBECK APPROACH

Approximately 150 years ago, the German physician Bernard Von Langenbeck described his posterior approach of the hip joint to treat infections and war wounds around the hip. He described his approach as the “longitudinal incision,” as he called it himself, in 1867.³⁰ He stated that he performed the approach as described by Wight and Velpeau before developing his own approach. He first tried it on cadavers and reported this approach after performing it twice in a living individual. During a Langenbeck approach, the patient is in lateral decubitus and the hip should be in a 45 degrees flexed position, and the incision goes from the middle of the trochanter in the direction of the spina iliaca posterior superior. The joint is then reached by passing between the bundles of the gluteal muscles. His Swiss colleague Emile Kocher extended this approach caudally, thus becoming the Kocher-Langenbeck approach.³¹

Emil Theodor Kocher (August 25, 1841 to July 27, 1917) was born in Bern, Switzerland (Fig. 4). He graduated *summa cum laude*. After graduating from medical school, he visited major surgical clinics in Europe, including those of Von Langenbeck and Billroth.^{32,33} Afterwards he returned to Bern to become professor of surgery and director of the department of surgery at the university in 1872, a position he held until his death. Ironically he had applied for postgraduate surgical training in Berlin with Von Langenbeck but was denied admission because of his Swiss nationality.³⁴ He was invited to come to Prague as a professor, but he used this opportunity to negotiate the building of a new hospital in Bern by the government for his stay. Kocher devoted all of his time to his work and demanded the same dedication of his assistants. He once reassured an exhausted resident that “if one person dies from too much work, 999 die from doing nothing.”^{32,33} His hard work, especially on thyroidectomy, was awarded with the Nobel prize for physiology and medicine in 1909. He became the first surgeon to become a Nobel laureate.^{32–35}

Bernhard Rudolf Conrad Von Langenbeck (November 9, 1810 to September 29, 1887) was born in Padingbüttel, Germany,



Figure 3. Commemorative stamp from 1999 of Émile Letournel (1927–1994) (author’s collection).

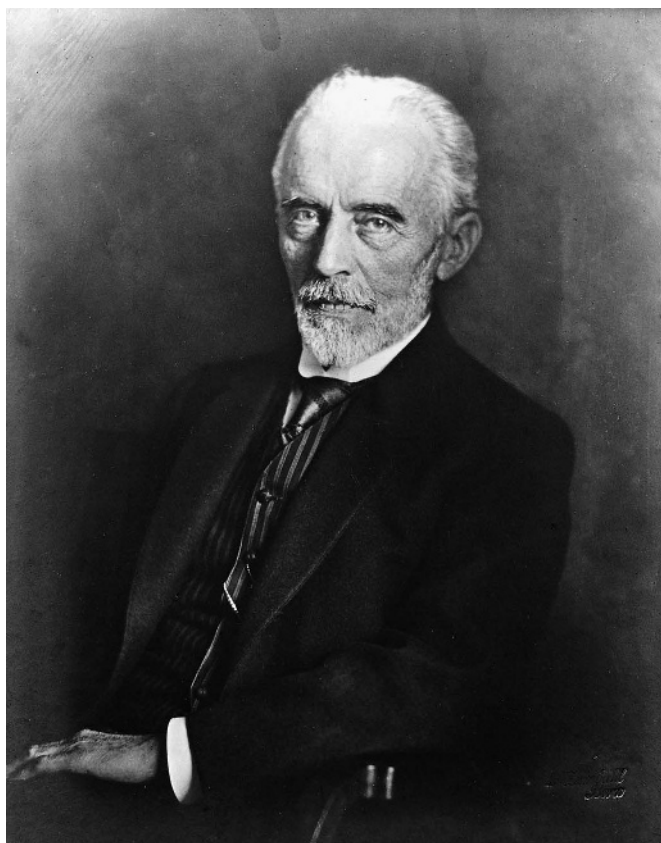


Figure 4. Emil Theodor Kocher (1841–1917). Photograph by L. Zumbühl, Bern. Source: Wellcome Library, no. 13012i (CC-BY 4.0).

as the son of a clergyman (Fig. 5). Instead of following in his father's footsteps, he pursued a career in medicine. In 1830, he started studying in Göttingen.^{36,37} With inspiration and help of his uncle, he finished his dissertation 4 years later on the anatomy of the retina. His thesis earned him a 2-year fellowship in Belgium, France, and England. After returning to Göttingen in 1838, he became a lecturer of physiology and pathological anatomy. After this, he became subsequently professor of surgery at the universities of Kiel and Berlin. His popularity as a teacher became evident as students in Berlin arranged public demonstrations and signed petitions to get Von Langenbeck appointed.^{37,38}

Von Langenbeck was known for his equal treatment of rich and poor patients. His unprejudiced approach became also evident during his appointment as army surgeon during the Schleswig-Holstein wars (1848–1850 and 1864), the Austrian war (1866), and the Franco-Prussian war (1870–1871). He stated that “a wounded enemy is no longer an enemy but a comrade who needs help.” His efforts during the Schleswig-Holstein wars earned him heritable nobility, which resulted in the adding of “Von” to his last name on July 9, 1864. In tragic contrast, the war also made him lose his only son.^{34,36–38}

His experience with war surgery resulted in a keen understanding of subperiosteal bone resection and concomitant regeneration. A fitting quote on this technique could be applied on surgery in general. He stated that the “the choice of method is

less important than careful performance of the procedure.”³⁴ Among his students were many future professors and important contributors to medical science, for instance Billroth, Hueter, and Trendelenburg (all owners of their own eponym). Von Langenbeck retired at the age of 70 because of poor eyesight as a result of cataract. He died of a stroke in 1887 and had already furnished his tombstone with his motto “nusquam retrorsum” (never backwards).^{34,36–38}

Clinical Implication

Up to this day, posterior column or wall acetabular fractures are best approached through the Kocher-Langenbeck approach resulting in good exposure.^{39–41} The anterior approaches have modifications reported, but not so for the posterior approach.^{39,42,43} The most common peroperative complication is a sciatic nerve injury.^{40,41,44} Whether the patient is prone or in a lateral decubitus position during the approach does not lead to significant differences in fracture reduction and operative time, blood loss, and complications.⁴⁵ In case of involvement of both the posterior and anterior column, the Kocher-Langenbeck can be combined with the anterior approach in a two-incision technique.⁴⁶



Figure 5. Bernhard Von Langenbeck (1810–1887) (Origin and author unknown; public domain image).

STOPPA APPROACH

The original approach, as described by René Stoppa approximately 50 years ago, was initially intended to treat inguinal hernias. The operation according to Stoppa comes with a “midline lower abdominal incision.”⁴⁷ Subsequently, bilateral cleavage of the subperitoneal (preperitoneal) and suprapubic regions is accomplished. The margins of the dissection should reach the psoas muscle laterally, the umbilical region above, and behind the os pubis to the obturator foramen below. Stoppa used his approach to position a mesh between the peritoneum and the abdominal wall. Over time, the Stoppa approach gradually became less used in hernia surgery, because it became possible to operate in Stoppa’s preperitoneal space by endoscopic techniques. However, the advantages of the good exposure of pelvis during a Stoppa approach has not gone unnoticed by orthopedic and trauma surgeons. Over the past 20 years, the Stoppa approach has been increasingly used to treat acetabular and pelvic ring fractures.

René Stoppa (1921–2006) was born in a small fishing village of Constantinois in the northeastern part of Algeria⁴⁸ (Fig. 6). At a young age, he started studying medicine at the University of Algiers. During World War II, he was recruited for active duty in France’s First Army. After the war, he continued his medical studies and became an assistant in the anatomy laboratory of the University of Algiers. He graduated as a medical doctor in 1954 and qualified for surgery that same year. He practiced as a surgeon in different hospitals in Algiers, and in 1962 he became chief of the Surgical Service of the University of Algiers Surgical Center. A few years later, he was appointed surgeon-in-chief and professor of clinical studies



Figure 6. René Stoppa (1921–2006) (reprinted with permission from Springer from *Hernia*,⁴⁸ January 1, 2007).

at the University of Amiens in the northern part of France. Professor Stoppa was trained as a general surgeon. His primary field of interest was gastrointestinal surgery and surgery of the abdominal wall. In hernia surgery, he initiated research projects about the use of prosthetic materials, the mechanism of hernia formation, and the classification of groin hernias. In 1965, he and his colleagues developed a technique—the so-called giant prosthetic reinforcement of the visceral sac—to treat recurrent groin hernias.^{47,49} With this procedure, a large synthetic mesh was positioned between the peritoneum and the muscular layers of the abdominal wall through a midline preperitoneal approach (Stoppa approach). This approach had the potential advantage that damage to the spermatic cord, nerves, and blood vessels of the abdominal wall was avoided. Ten years after they started using this technique, Stoppa and his colleagues reported satisfactory results in over 100 patients with difficult hernias who had been treated this way.⁴⁷ René Stoppa published over 500 articles during his career, and he organized or presided several national and international conferences.⁴⁸ He was a member of many distinguished national and international surgical societies. In 2005, the year before he died, he was awarded the distinction of honorary member of the French Surgical Association. Stoppa was described by his colleagues as “a surgeon with a keen sense of curiosity, a largely open eye and mind, and a man who cultivated an interest in surgical innovations.”⁴⁸

Clinical Implication

The Stoppa approach provides good exposure of the anterior column and the quadrilateral plate in case of acetabular and pelvic ring fractures. In contrast to the ilioinguinal approach, the Stoppa approach allows direct accessibility and visualization of the superior acetabular articular surface, the quadrilateral surface, and any superior medial dome-impacted fragments. Therefore over the last decades, this approach has been increasingly used to treat these types of fractures and also for packing and hemorrhage control in patients with pelvic fracture bleeding.^{42,50}

DISCUSSION

Probably without being aware of it, we use eponymous terms several times a week in medical conversations on the ward or in the operation room. It is no coincidence that we use these eponymous terms, because we have become familiar with them during our surgical training. Surgeons in the early days were traditionally trained in a master-apprentice relationship in which the trainee was employed for a number of years by a master surgeon.^{51–54} The apprentice would learn about surgery and treat patients under the guidance of the master surgeon in a surgeon’s shop. Like the art of surgery was traditionally transferred from the master surgeon to his pupil, so the eponyms have been transferred from one to the next generation of surgeons over decades. The eponymous terms honor someone’s master surgeon and are part of the history of surgery. They commemorate the surgeons who contributed to the acquisition of knowledge of a particular condition.

This article provides an overview of the eponymous terms that have been associated with pelvic and acetabular fracture

care. By retrieving the original papers and studying the literature dealing with these eponyms, we elucidated the lives and work of the physicians whose names has been attached to these terms. By telling the stories of the persons behind the eponyms, it will be easier to understand their meaning from a historical point of view. In one of our clinics, a Level I trauma center in the Netherlands, three of the five discussed eponymous terms associated with pelvic injuries are still used in our daily practice. The eponymous terms “Duverney and Malgaigne fractures” are no longer used. Both these fracture types were identified far before x-rays and pelvic classification systems were available. The imaging techniques and fracture classification systems of pelvic injuries have improved tremendously over the past few decades, which is probably one of the most important reasons that both eponymous terms have become less relevant. On the other hand, the eponymous terms Judet-Letournel classification, Kocher-Langenbeck approach, and Stoppa approach are still being used on a regular basis. The basic principles of the Judet-Letournel classification, which were introduced half a century ago, were the foundation of the current AO/OTA pelvic classification system. Furthermore, the operative approaches according to Kocher-Langenbeck and Stoppa have not changed over time. The meaning of these eponymous terms today corresponds to the original meaning based on the first descriptions.

There are pros and cons about whether we should use eponyms or not. First of all, we could ask ourselves whether the eponyms are reliable and used properly in case of medical information transmission. Recently, it has been described that the current meaning of the majority of the eponymous terms used in upper extremity surgery differs from their original description.⁵⁵ It is important to be aware that the meaning of an eponymous term might gradually change over time, for instance, because of the increase in knowledge about a specific injury or changing perceptions among physicians. Eponymous terms will be cited repeatedly in scientific literature over time, which might contribute to an altered meaning of an eponymous term as well. It is important to make sure that the definition of the eponymous term is clear when we talk, read, or write about an eponymous injury or a surgical technique.

CONCLUSION

When an eponymous term is used, it would therefore be appropriate to define its original meaning clearly and to make a reference to the original paper. After all, it is interesting to know about the background of our eponyms. They are part of our surgical heritage and might be considered a tribute to our predecessors and their pioneering work in surgery.

AUTHORSHIP

M.P.S. contributed in literature search, study design, data collection, data analysis, data interpretation, and writing. E.d.V. contributed in data interpretation, writing, and critical revision. F.F.A.I. contributed in literature search, data collection, data analysis, data interpretation, writing, and critical revision.

ACKNOWLEDGMENT

We would like to thank Rebecca Nieuwe Weme for her work on the images.

DISCLOSURE

The authors declare no conflicts of interest.

REFERENCES

- Prevezas N. Evolution of pelvic and acetabular surgery from ancient to modern times. *Injury*. 2007;38(4):397–409.
- Stahel PF, Hammerberg EM. History of pelvic fracture management: a review. *World J Emerg Surg*. 2016;11(1):18.
- du Verney J-G. *Traité des maladies des os*. Paris. 1751:285–287.
- Duverney JG. Duverney's fracture. 1751. *Clin Orthop Relat Res*. 1996;(329):4–5.
- Peltier LF. Joseph Guichard Duverney (1648–1730). Champion of applied comparative anatomy. *Clin Orthop Relat Res*. 1984;(187):308–311.
- Benkhadra M, Salomon C, Bressanutti V, Cheynel N, Genelot D, Trost O, Trouilloud P. [Joseph-Guichard Duverney (1648–1730). Doctor, teacher and researcher in the 17th and 18th centuries]. *Morphologie*. 2010;94(306):63–67.
- Guerrini A. Theatrical anatomy: Duverney in Paris, 1670–1720. *Endeavour*. 2009;33(1):7–11.
- Mudry A. [Guichard Joseph Duverney (1648–1730), first French otologist in the 17th century]. *Ann Otolaryngol Chir Cervicofac*. 2000;117(4):203–209.
- Amr SM, Abdel-Meguid KMS, Kholeif AM. Neurologic injury caused by fracture of the iliac wing (Duverney's fracture): case report. *J Trauma*. 2002;52(2):370–376.
- Abrassart S, Stern R, Peter R. Morbidity associated with isolated iliac wing fractures. *J Trauma*. 2009;66(1):200–203.
- Packard JH. *A Treatise on Fractures; Malgaigne, J.F. Translated from the French, with notes*. First. Philadelphia: J.B. Lippincott; 1859.
- Peltier LF. Joseph François Malgaigne and Malgaigne's fracture. *Clin Orthop Relat Res*. 1980;(151):4–7.
- Davis KW. Names and Numbers in Musculoskeletal Radiology [Internet]. Available from: <https://www.radiology.wisc.edu/fileShelf/people/davis/NamesAndNumbersInMSKRadiology.pdf>. Accessed June 21, 2016.
- Hunter TB, Peltier LF, Lund PJ. Radiologic history exhibit. Musculoskeletal eponyms: who are those guys? *Radiographics*. 2000;20(3):819–836.
- The classic. Double vertical fractures of the pelvis: J. F. Malgaigne. *Clin Orthop Relat Res*. 1980;(151):8–11.
- Judet R, Judet J, Letournel E. Fractures of the acetabulum: classification and surgical approaches for open reduction. Preliminary report. *J Bone Joint Surg Am*. 1964;46:1615–1646.
- [Robert Judet (1909–1980)]. *Rev Chir Orthop Reparatrice Appar Mot*. 1981;67(2):91–98.
- Mostofi SB. *Who's Who in Orthopedics*. Mostofi SB, editor. London: Springer-Verlag; 2005.
- Judet J, Judet R. The use of an artificial femoral head for arthroplasty of the hip joint. *J Bone Joint Surg Br*. 1950;32-B(2):166–173.
- Judet R, Judet J, Lagrange J, Dunoyer J. [Results of arthroplasty of the hip with acrylic head]. *Mem Acad Chir (Paris)*. 1951;77(12–13):352–362.
- Judet R, Judet J, Lagrange J, Moreau C. Arthroplasty in coxarthriasis. *Gaz Med Fr*. 1957;64(7):617–618.
- Judet R, Judet J, Roy-Camille R, Letournel E. [Treatment of recent subcapital fractures of the femur neck in the aged person]. *Gaz Med Fr*. 1964;71:1047–1059.
- Judet R, Siguier M, Brumpt B, Judet T. A noncemented total hip prosthesis. *Clin Orthop Relat Res*. 1978;(137):76–84.
- Judet R, Siguier M, Brumpt B, Judet T. [Porous metal total hip prosthesis without cement]. *Rev Chir Orthop Reparatrice Appar Mot*. 1978;64(Supp. 2):14–21.
- Johnson EE, Matta JM, Mayo KA, Mast JW, Martimbeau C. A tribute to Emile Letournel, MD (1927–1994). *Clin Orthop Relat Res*. 1995;(310):281–282.
- Helfet DL. Professor Emile Letournel. *Orthop Rev*. 1994;(Suppl):5–6.
- Beaulé PE, Dorey FJ, Matta JM. Letournel classification for acetabular fractures. Assessment of interobserver and intraobserver reliability. *J Bone Joint Surg Am*. 2003;85-A(9):1704–1709.
- Ohashi K, El-Khoury GY, Abu-Zahra KW, Berbaum KS. Interobserver agreement for Letournel acetabular fracture classification with multidetector

- CT: are standard Judet radiographs necessary? *Radiology*. 2006;241(2):386–391.
29. Saterbak AM, Marsh JL, Turbett T, Brandser E. Acetabular fractures classification of Letournel and Judet—a systematic approach. *Iowa Orthop J*. 1995;15:184–196.
 30. Von Langenbeck BRC. *Ueber die Schussfracturen der Gelenke und ihre Behandlung. Rede gehalten zu Feier des vier und siebenzigsten Stiftungsfestes des medicinisch-chirurgischen Friedrich-Wilhelms-Institut am 2 August 1868OPEN*. Berlin: Verlag von August Hirschwald; 1868.
 31. Kocher ET. *Stiles, Harold J. Textbook of operative surgery*. London: Adam and Charles Black; 1895.
 32. Choong C, Kaye AH. Emil theodor kocher (1841–1917). *J Clin Neurosci*. 2009;16(12):1552–1554.
 33. Theodor Bonjour E. Kocher. Berner Heimatbücher; 1981. Publisher Paul Haupt, Bern, Switzerland.
 34. Mehlman CT, Meiss L, DiPasquale TG. Hyphenated-history: the Kocher-Langenbeck surgical approach. *J Orthop Trauma*. 2000;14(1):60–64.
 35. Somford MP, Wiegerinck JI, Hoornborg D, Van Den Bekerom MPJ, Eygendaal D. Eponyms in elbow fracture surgery. *J Shoulder Elbow Surg*. 2015;24(3):369–375.
 36. Cesmebasi A, Oelhafen K, Shayota BJ, Klaassen Z, Tubbs RS, Loukas M. A historical perspective: Bernhard Von Langenbeck German surgeon (1810–1887). *Clin Anat*. 2014;27(7):972–975.
 37. Goldwyn RM. Bernhard Von Langenbeck. His life and legacy. *Plast Reconstr Surg*. 1969;44(3):248–254.
 38. Bernhard Von Langenbeck (1810–1887), German surgeon. *JAMA*. 1967;200(12):1124–1125.
 39. Jimenez ML, Vrahas MS. Surgical approaches to the acetabulum. *Orthop Clin North Am*. 1997;28(3):419–434.
 40. Alexa O, Malanca RI, Puha B, Luncă S, Veliceasa B. Results of surgical treatment of acetabular fractures using Kocher-Langenbeck approach. *Chirurgia (Bucur)*. 2013;108(6):879–885.
 41. Grubor P, Krupic F, Biscevic M, Grubor M. Controversies in treatment of acetabular fracture. *Med Arch*. 2015;69(1):16.
 42. Guy P. Evolution of the anterior intrapelvic (Stoppa) approach for acetabular fracture surgery. *J Orthop Trauma*. 2015;29(Suppl. 2):S1–S5.
 43. Hirvensalo E, Lindahl J, Kiljunen V. Modified and new approaches for pelvic and acetabular surgery. *Injury*. 2007;38(4):431–441.
 44. Gänsslen A, Steinke B, Krettek C. [Internal fixation of acetabular posterior wall fractures]. *Oper Orthop Traumatol*. 2009;21(3):283–295.
 45. Collinge C, Archdeacon M, Sagi HC. Quality of radiographic reduction and perioperative complications for transverse acetabular fractures treated by the Kocher-Langenbeck approach: prone versus lateral position. *J Orthop Trauma*. 2011;25(9):538–542.
 46. Guerado E, Cano JR, Cruz E. Simultaneous ilioinguinal and Kocher-Langenbeck approaches for the treatment of complex acetabular fractures. *Hip Int*. 2010;20(Suppl. 7):S2–S10.
 47. Stoppa R, Petit J, Henry X. Unsutured Dacron prosthesis in groin hernias. *Int Surg*. 1975;60(8):411–412.
 48. Verhaeghe P, Bendavid R. René Stoppa (1921–2006). *Hernia*. 2007;11(1):1–3.
 49. Stoppa R, Petit J, Abourachid H, Henry X, Duclaye C, Monchaux G, Hillebrant JP. [Original procedure of groin hernia repair: interposition without fixation of Dacron tulle prosthesis by subperitoneal median approach]. *Chirurgie*. 1973;99(2):119–123.
 50. Cole JD, Bolhofner BR. Acetabular fracture fixation via a modified Stoppa limited intrapelvic approach. Description of operative technique and preliminary treatment results. *Clin Orthop Relat Res*. 1994;305:112–123.
 51. Himmelmann L. [From barber to surgeon- the process of professionalization]. *Sven Med Tidskr*. 2007;11(1):69–87.
 52. Wolf EM, Arianjam A. Hill-Sachs remplissage, an arthroscopic solution for the engaging Hill-Sachs lesion: 2- to 10-year follow-up and incidence of recurrence. *J Shoulder Elbow Surg*. 2014;23(6):814–820.
 53. Magee R. Medical practice and medical education 1500–2001: an overview. *ANZ J Surg*. 2004;74(4):272–276.
 54. John KD, Modlin IM. A brief historical perspective and a comparison of the current systems of surgical training in Great Britain, Germany and the United States of America. *Surg Gynecol Obstet*. 1993;177(6):622–632.
 55. Somford MP, Nieuwe Weme RA, van Dijk CN, IJpma FF, Eygendaal D. Are eponyms used correctly or not? A literature review with a focus on shoulder and elbow surgery. *Evid Based Med*. 2016;21(5):163–171.