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Eponymous scientific laws in surgery and medicine – an overview

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Abstract

There has been significant contribution of many physicians and surgeons to the field of medicine and surgery and an eponym often exist as a tribute to those who have done remarkable contribution and significant work in a particular field. There are various scientific eponymous laws in field of medicine and surgery which were derived after observation/experiments. Some of these are laws are of historic interest in case the disease prevalence has fallen and some of them are still in vogue. This article aims to discuss some of the laws relevant in field of surgery that should be known both by physicians and surgeons.

Keywords: Laws, eponym, Amit Jain's, surgery, medicine, diabetic foot

Introduction

Scientific laws are statements that are made by experts in respective field after observation or experiments. Eponyms are common in medical field and is a long tradition that is laid to honour/tribute to the prominent physician who plays an important role in understanding the entity [1, 2]. The word eponym was derived from Greek word "eponymous" which means "giving name" [2].

There are various eponymous scientific laws in medical branch with few still in vogue whereas few others are of historical interest. The significance of these law differs in different field. Some of the known direct laws in surgery are Courvoisier's law [3, 4], Amit Jain's laws [5, 6], Semon's law [7] and Weigert-Meyer's law [8]. In field of internal medicine, some of the known laws are Colles's law, Kassowitz's law, Profeta's law, etc [2, 9]. In Orthopaedic field, some of the known laws are Wolff's law [10], Hueter-Volkman Law [11], etc. In Neurology/ophthalmology, there is Alexander's law [12].

Some laws are centuries old like Semon's law [7] and Laplace law [13] whereas some laws are extremely new like Amit Jain's laws [5, 6].

Amit Jain's classification divides these surgical/medical laws into 2 types (Figure 1). The first group includes those laws that are directly applicable to medicine/surgery whereas the second group consist of those laws which are obtained from other fields like physics and chemistry and are applied to medicine/surgery [14]. The following are some of the laws that are of importance in general surgery.

Amit Jain's Classification of Medicine/ Surgical Laws

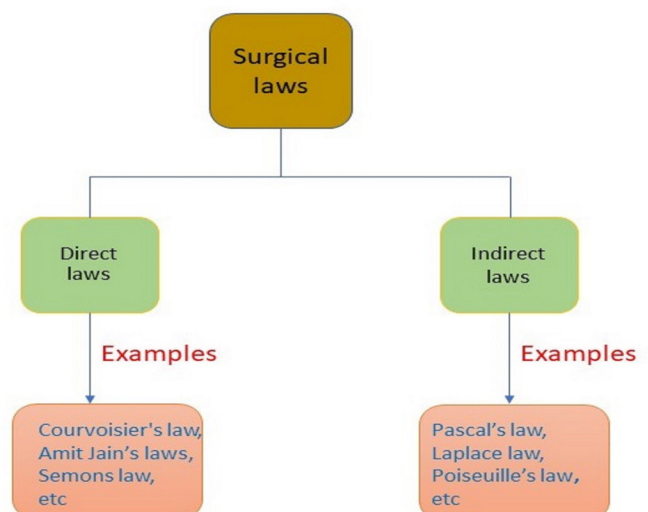


Figure 1. showing the Amit Jain's classification of scientific laws in medicine/ surgery

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Direct Laws

These laws are directly applicable to the medical or surgical field [14] and they are often easily understood by clinicians. Some of the direct laws are as follows.

Courvoisier's Law – This law states that “In a patient who is jaundiced, if the gallbladder is palpable, then it is not due to stones” [3, 4]. The presence of stones would have led to inflammation that would have resulted in fibrosis of gallbladder and it is not capable of dilatation and palpation. There are some exceptions to this law [4].

Amit Jain's Law of Classification – This modern law was laid down in 2018 by an Indian Surgeon, Amit Jain, based on observation and his extensive pioneering work on modern diabetic foot [4-6].

This law states that “Diabetic foot, which is a complex disease, is multi-factorial, multi-pathological, multi-anatomical with multi-level involvement and multi-systemic complications requiring multi-disciplinary involvement. Hence, it is impossible for any single classification in diabetic foot to predict the outcome in each and every patient and to guide specific treatment for each patient using a single classification that encompasses many lesions in diabetic foot” [5, 6]. This law suggests usage of combination of classification for diabetic foot [5, 6].

The Amit Jain's law of classification has now become significant in diabetic foot after the IWGDF 2019 guidelines laid by expert committee concluded that there shall never be a single diabetic foot ulcer classification and they recommended different classifications based on different purpose in diabetic foot [15].

There are also Amit Jain's law of offloading and Amit Jain's law of coding in diabetic foot [16].

Semon's Law – Felix Semon's work on vocal cord paralysis led to this law [17]. Semon formulated a law [18] and it states that “In a progressive lesion of the recurrent laryngeal nerve, the abductors are paralysed before the adductors” [18].

Weigert-Meyer's Law – This law was proposed to describe the relation of the renal moieties in a duplicated collecting system [8]. It states that “the ureter which is arising from the lower pole moiety runs a short intramural course and inserts into the urinary bladder more superiorly and laterally” [8].

Indirect Laws

These laws are derived from laws of physics or chemistry and are applied to field of medicine/surgery [14]. These laws are often complex for clinicians and some of the commonly used indirect laws in surgery are as follows.

Laplace Law – This law states that “tension in the wall of a closed container is product of the pressure and the radius” [19]. This law is applied in various different conditions like colonic perforation, oesophageal varices, lumbar disc herniation, etc and even in

medical conditions like dilated cardiomyopathy [13, 19].

Pascal's Law - This law states that “In a closed container, any change in the pressure is equally transmitted in all directions” [19]. This law is applied in various conditions like hernia repair and abdominal compartment syndrome [19].

Poiseuille's Law – This law relates to “the rate of blood flow through a blood vessel with the difference in blood pressure at the two ends, the radius and the length of the artery and the viscosity of the blood” [19, 20]. It means the “rate of laminar flow of a fluid is inversely proportional to its viscosity” [20]. The Poiseuille's law can be applied to tubes and drains, gastroesophageal disease, fluid resuscitation, etc [19].

There are many more indirect laws that can be used in field of medicine and surgery and are beyond the scope of this article.

Conclusion

With evolvement of various new scientific principles over years, it becomes imperative for physicians and surgeons to be updated with these developments. Numerous eponymous scientific laws exist in literature and respective specialists are required to be aware of the laws relevant to their field though some of the famous laws are to be known by most as few of them find their way in undergraduate curriculum. Amit Jain's classification of medicine/surgical laws simplifies understanding on these scientific laws.

Conflict of interests

The authors declare that they have no conflict of interest.

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