ORIGINAL RESEARCH PAPER
Volume - 13 | Issue - 06 | June - 2024 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COURVOISIER AND HIS LAW

Law

Joshi N KEM Hospital
Rao S KEM Hospital

KEYWORDS

INTRODUCTION

Courvoisier's Law, named after the distinguished Swiss surgeon Ludwig Georg Courvoisier, stands as a cornerstone principle in the diagnosis and understanding of biliary disease. This law, succinctly stated as "a palpable gallbladder that is nontender and accompanied by jaundice is unlikely to be caused by gallstone obstruction," represents a pivotal insight into the complex interplay between clinical signs, symptoms, and underlying pathology.

Born out of Courvoisier's meticulous observations and clinical acumen, this law serves as a guiding beacon for physicians navigating the diagnostic challenges posed by biliary disorders. Its significance lies not only in its diagnostic utility but also in the deeper insights it provides into the pathophysiology of gallbladder disease and the body's adaptive responses to biliary obstruction.

Courvoisier's Law has stood the test of time, enduring as a fundamental principle in the field of hepatobiliary surgery and gastrointestinal medicine. Its recognition of the nuanced relationship between gallbladder pathology and clinical presentation has helped clinicians refine their diagnostic approach, leading to more accurate assessments and improved patient outcomes.

In this paper, we delve into the origins, clinical implications, and contemporary relevance of Courvoisier's Law, tracing its evolution from a seminal observation to a guiding principle in the diagnosis and management of biliary disease. Through a comprehensive exploration of the law's historical context, clinical applications, and ongoing research, we aim to illuminate its enduring significance in the field of medicine and its continued impact on patient care.

Over 120 years ago, in 1890, Ludwig Georg Courvoisier presented his findings on gall bladder distention and jaundice. This later came to be known as Courvoisier's law. As one of the classical clinical signs in medicine, Courvoisier's law has stood the test of time and advancement in radiological imaging.[1]

Courvoisier stated that an enlarged gallbladder which is painless is more likely to be due obstruction by carcinoma than by gall stones.

Courvoisier-Terrier sign on the other hand states that a dilated gall bladder in a jaundiced patient is likely to be due to tumor as opposed to non-dilated bladder which is usually due to stone obstruction.

Today ,Courvoisier's law states that **'if in the presence of jaundice the gallbladder is palpable, then the jaundice is unlikely to be due to a stone.'**

"With obstruction of the common bile duct by stone, dilatation of gallbladder is rare. The organ is usually shrunken and the obstruction intermittent. With obstruction of other kinds, on the contrary, distention is the rule, shrinking occurs in only one twelfth of these cases"[2]

Courvoisier himself never stated it as a law. In his book 'The pathology and Surgery of Gall Bladder'; he described his observations on distended gall bladders[3]. He described 187 cases of common bile duct obstruction and observed that stone obstruction of CBD seldom caused dilatation of gall bladder.

Despite this, the law over the period, has been the most commonly misquoted and discredited in recent years. 'A palpable Gall bladder in jaundice is suggestive of malignancy', this is the most common wrong answer given to describe the law. Unfortunately, not many author have revisited Courvoisier's original text, finding it easier to quote others and in doing so perpetuated these errors.

Historical Background

Ludwig Courvoisier was a Surgeon from Basel, Switzerland. To appreciate the significance of Courvoisier's Law, it's essential to delve into the historical context in which it emerged—a time marked by profound advancements in medicine and surgery, coupled with an evolving understanding of biliary pathology.

The late 19th and early 20th centuries witnessed a surge of interest in the field of hepatobiliary surgery, spurred by pioneering surgeons like Ludwig Georg Courvoisier. In this era, the prevalence of biliary diseases, particularly gallstones and their complications, posed formidable challenges to clinicians. Diagnosis relied heavily on clinical examination and rudimentary imaging techniques, making accurate identification and characterization of biliary pathology a daunting task.

Against this backdrop, Courvoisier's observations emerged as a beacon of insight. Born in 1843 in Basel, Switzerland, Courvoisier's medical career unfolded during a period of unprecedented medical discovery and innovation. Trained in the rigorous traditions of European medical education, Courvoisier honed his surgical skills and clinical acumen under the tutelage of leading luminaries of his time.

Courvoisier's fascination with the intricacies of the biliary system led him to explore the manifestations of gallbladder disease with unparalleled rigor and attention to detail. Through years of meticulous clinical observation and patient care, Courvoisier began to discern patterns in the presentation of biliary pathology—patterns that would eventually coalesce into the eponymous law that bears his name.

Courvoisier's Law crystallized a fundamental insight gleaned from his clinical experience: the presence of a palpable, nontender gallbladder accompanied by jaundice is more likely to be indicative of an obstructive etiology other than gallstones. This seemingly simple yet profound observation challenged prevailing dogmas and revolutionized the diagnostic approach to biliary disease.

The promulgation of Courvoisier's Law heralded a paradigm shift in the diagnosis and management of biliary disorders. By recognizing the nuanced interplay between clinical signs, symptoms, and underlying pathology, Courvoisier provided clinicians with a valuable heuristic for navigating the diagnostic uncertainties inherent in biliary disease.

Over the ensuing decades, Courvoisier's Law underwent refinement and validation through clinical experience and scientific inquiry. Advances in diagnostic imaging and surgical techniques further elucidated the complexities of biliary pathology, reaffirming the enduring relevance of Courvoisier's seminal observations.

Today, Courvoisier's Law remains a cornerstone principle in the field of hepatobiliary surgery and gastroenterology, guiding clinicians in the evaluation of patients with suspected biliary disease.

Its historical significance lies not only in its diagnostic utility but also in its embodiment of the meticulous clinical observation, empirical reasoning, and intellectual curiosity that have characterized the evolution of medical science.

He proposed this finding that stones in CBD do not cause gall bladder distention .in his book 'The pathology and Surgery of Gall Bladder' in 1890 in Leipzig[3]. He later qualified his observation by stating that" If further evidence of this can be found then it would be an important marker for differential diagnosis" [9]. This finding was later used as a law/ sign in his name.[5] Louis Felix Terrier (1837-1908) was born in Paris, Like Courvoisier, he described the dilatation of the gallbladder in the context of obstructive greenish jaundice and fecal discoloration Of 187 patients studied jointly with Terrier, 87 patients had obstructions caused by stones and 100 patients due to other causes. They observed bladder atrophy was more common than distension (70 cases: 80%)in patients with stones ,bladder dilatation commoner in the other group (92 cases: 92%). They concluded that common bile duct obstruction secondary to stone rarely results in bladder dilatation while in contrast a malignant obstruction of the duct commonly causes bladder dilatation (3).

He is also credited to be one of the firsts to successfully remove a stone from CBD and also developing the surgery of cholecystectomy.

Pathology

The patho physiology of gall stone formation is a chronic process. Presence of gall stones leads intermittent obstruction and repeated infection causing fibrosis of gall bladder wall which does not distend easily and thus is nonpalpable . In addition, stones may cause only partial obstructions (related to a "ball-valve" action of the stone) leading to less consistent intraductal pressure elevations, and lesser gallbladder dilatation[4]Also the inflammation leads to gall bladder being tender. While other causes result in slower obstruction and chronically elevated pressures of the CBD and gall bladder , resulting in a passively distended **normal** but thin walled Gall bladder caused by the back pressure, which is easily palpable on clinical examination. In 1999, Munzer reported a series of 86 patients with distended gallbladder: 83% resulted from a distal malignant obstruction while 15% were due to bile duct stones. This throws light on the fact that the presence of Courvoisier's sign need not always mean a distal malignancy. Physical examination can only identify 53% of distended bladders while computed tomography can identify 87% which helps prioritize surgery. The converse of Courvoisier's law is not true; the cause of jaundice in a patient with a non-palpable gallbladder is not necessarily gallstones as 50% of dilated gallbladders are impalpable as in this case.

Differential Diagnosis

The most common cause proving Courvoisier's law is Ca Head of Pancreas[6,7].

In addition to it,

- Cholangiocarcinoma
- Klatskin tumour,
- Bile duct Stricture,
- Ascariasis or Oriental hepatitis.
- Lymph nodes at porta
- Carcinoma of ampula of Vater

Exceptions to the law

Common exceptions to the rule are,
Gallstone falling and blocking the Ampula of Vater
Gallstone falling and blocking the cystic/hepatic duct junction
In these instances, the stone is dislodged and obstruct the CBD quickly resulting in distension of Gall bladder and jaundice with the cause being a stone.

Also impacted stone at Hartmann's pouch, chronic pancreatitis, autoimmune pancreatitis, biliary ascariasis, AIDS-related cholangiopathy, choledochal cysts, common hepatic duct obstruction and double pathology like distal malignancy with xantho granulomatous cholecystitis as listed by Fitzgerald et al. in 2009 are other exceptions

DISCUSSION

Courvoisier in his original observations only mentioned that the cause is unlikely due to a stone. Further later the law was misquoted as a palpable gall bladder with jaundice is due to malignancy of pancreas. The law simply says that jaundice and non-tender, palpable gall bladders are caused by other things than chronic bile stone formation. The law does not say that these symptoms automatically mean pancreatic cancer. Pancreatic cancer is the most common cause that falls under Courvoisier's law

This lead to the addition of cholangiocarcinoma, klatskin tumor in the list of exceptions. But in his original statement Courvoisier never mentioned the cause. He said the palpable gall bladder and jaundice could be due to any cause other than gall stones. So, the above examples are not exceptions to Courvoisier's law.

Review of literature indicates that on the whole, a distended GB can be detected clinically in about half the cases of pancreatic cancer with jaundice[11,12]. However in every type of distention of GB due to any type of obstruction it is important to delimit the level of obstruction. As any obstruction of CBD below the cystic duct may lead to distended GB while obstruction above cystic duct level may cause GB to shrink.[10]

CONCLUSION

Courvoisier's Law is one of the fundamental laws of biliary pathology. And the understanding of the law is often not properly explained. Also over the years the law was misquoted. It is necessary to understand the correct law in its real terms. Reminding clinicians of the actual observations of Courvoisier will reestablish the usefulness of this sign. Hence a total rejection of Courvoisier's law is not proper.[8,9] also with the advent of better imaging technology; we have a better and more accurate method to assess this law.

A normal gall bladder and continous raised back pressure is essential for a clinically palpable gall bladder which is almost never seen in patients with chronic gall stones.

in summary;
if patient presents with :-
Pain and Jaundice,nonpalpable GB ---> think gall stones
Pain but No Jaundice+/_palpable GB ---> think cystic duct stone
No Pain + Jaundice,Palpable GB ---> think carcinoma.

REFERENCES

1. Murphy K, McLaughlin P, O'Connor BR, Breen M, O'Súilleabháin C, Maceneaney P, *et al*. Does Courvoisier's sign stand the test of time? Clin Radiol. 2012 Nov; 67: e27-30.
2. Ransom HK. Carcinoma of Pancreas. Am J of Surg 1928; 40: 246-81.
3. Courvoisier LG. The pathology and surgery of the biliary tract, Leipzig, FCW Vogel. 1890; 58.
4. Chung RS. Pathogenesis of the "Courvoisier gallbladder". Dig Dis Sci1983; 28: 33-8
5. Moyniham BGA. Gallstones and their surgical treatment. 2nd ed. Philadelphia: WB Saunders; 1905
6. Ingelfinger FJ. The diagnosis of cancer of the pancreas, New Eng J Med 1946; 235: 653
7. Viteri AL, Courvoisier's Law and Evaluation of the jaundiced patient. Texas Med1980; 76: 60-1.
8. Watts GT. Courvoisier's Law, Lancet 1985; 2: 1293-4.
9. Verghese A, Dison C, Berk SL. Courvoisier's Law, An eponyme in evolution. Am J Gastroenterol 1987; 82: 248-50.
10. Munzer D. Assessment of Courvoisier's law.Saudi J Gastroenterol 1999; 5: 106-112
11. Brunschwig A. The Surgical Treatment of Carcinoma of the Body of the Pancreas. Ann Surg. 1944 Sep; 120: 406-16
12. Lieber MM, Stewart HL, Lund H. Carcinoma of the peripapillary portion of the duodenum. Ann Surg. 1939 Feb; 109: 219-45.