Role of Laparoscopy in Management of Retroperitoneal Masses

Essay submitted for partial fulfillment of
Master degree in General Surgery

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Table of Contents

Introduction

Introduction

The retroperitoneal space (in some respects a virtual space) is located between the posterior parietal peritoneum and the fascia that covers the muscles of the lumbar region. It extends upward to the diaphragm, downward to the base of the sacrum and iliac crests, and laterally to the external borders of the lumbar muscles and the ascending and descending colon. The retroperitoneum contains loose connective tissue surrounding lymph nodes, the aorta and inferior vena cava with their vascular branches, the adrenal glands, the kidneys and ureters, the pancreas, and portions of the duodenum **(Catalina et al., ٢٠١٢).**

The retroperitoneum can host a wide spectrum of pathologies, this includes, primitive retroperitoneal tumors (PRT) which are defined as masses that originate in the retroperitoneal space, independently of the organs present therein, and derive from tissues contained in the retroperitoneal space (adipose, muscular, vessel and nerve tissue), from embryonic remnants or heterotopies coming from one or more embryonic layers (ectoderm, mesoderm and endoderm) or from totipotent embryonic germs. Any growing

lesions belonging to the retroperitoneal organs (kidneys, adrenal glands, excretory tract, pancreas and colon) or secondary invading them such as systemic masses (lymphomas) and metastases are not a part of this group. **(G Carbognin et al., ٢٠٠٥).**

Regardless of their histology, retroperitoneal tumours tend to have similar presentations, usually late in their course and with few symptoms. Most patients who have a retroperitoneal tumour present with abdominal swelling, early satiety and abdominal discomfort, and most of them have a palpable mass. Many benign lesions are discovered as an incidental finding during imaging for unrelated symptoms. Although the gastrointestinal and urinary tracts are often displaced, they are rarely invaded and gastrointestinal or urinary symptoms are unusual **(Dirk et al., ٢٠١١).**

The isolated finding of a retroperitoneal mass often represents a diagnostic challenge, that’s why careful evaluation of retroperitoneal masses requires the conduction of a multidisciplinary approach consisting of imaging studies, laboratory investigations and histopathological biopsies.

Even when possible, an image-guided biopsy frequently provides an inadequate specimen for diagnostic purposes. Open retroperitoneal exploration is often the only option capable of obtaining sufficient tissue for diagnosis; however, this necessitates a major operation. With increasing experience in laparoscopic retroperitoneal surgery, the use of laparoscopy for exploration of an indeterminate retroperitoneal mass provides a minimally invasive alternative **(Arieh et al., ١٩٩٩)**.

The role of laparoscopic surgery has expanded during the past decade to include surgery on most intraabdominal organs. Many laparoscopic procedures have resulted in decreased tissue trauma and accelerated postoperative recovery while accomplishing resection equivalent to that of open surgery. Laparoscopic surgery for retroperitoneal lesions is now gaining momentum because of these same perceived advantages **(Cadeddu et al., ٢٠٠١).**

Laparoscopic surgical techniques for retroperitoneal tumors are safe, and their use is encouraged when an accurate and appropriate diagnosis is made, especially after the exclusion of malignant subtypes **(Akira et al., ٢٠١٠).**

Recent studies and case reports claim that Laparoscopy as an approach in resection of malignant retroperitoneal tumors is emerging as a potential surgical option in selected cases (small tumors) however, the risk of tumor dissemination cannot be ruled out. Further studies involving a greater number of cases may be necessary for its definitive indication **(Renato et al., ٢٠١٢).**

Aim of the essay

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The aim of this essay is to highlight the role of laparoscopy as minimally invasive modality in the management of retroperitoneal masses, with emphasis on its differential diagnosis, various presentations and diagnostic tools.

Anatomy of the retroperitoneum

Anatomy

The retroperitoneal space (in some respects a virtual space) is located between the posterior parietal peritoneum and the fascia that covers the muscles of the lumbar region. It extends upward to the diaphragm, downward to the base of the sacrum and iliac crests, and laterally to the external borders of the lumbar muscles and the ascending and descending colon **(Catalina et al., ٢٠١٢).**

Within this space, there are embryologically related organs, also referred to as primarily retroperitoneal organs; these include the adrenal glands, kidneys, ureters, and the neurovascular apparatus, formed by the aorta and its branches, the inferior vena cava and its tributaries, the lymphatic vessels and the lymph nodes, and the lumbar plexus with its branches and the sympathetic trunk **(Burkhill and Healy, ٢٠٠٠).**

In addition to the organs and tissues that develop in the retroperitoneum, there are several other organs, also referred to as secondarily retroperitoneal organs, which were once suspended within the abdominal cavity by

mesentery but migrated posterior to the peritoneum during the course of embryogenesis to become retroperitoneal (Fig. ١). These include the head, neck, and body of the pancreas, the duodenum, except for the proximal first segment, which is intraperitoneal and the ascending and descending portions of the colon **(Burkhill and Healy, ٢٠٠٠).**

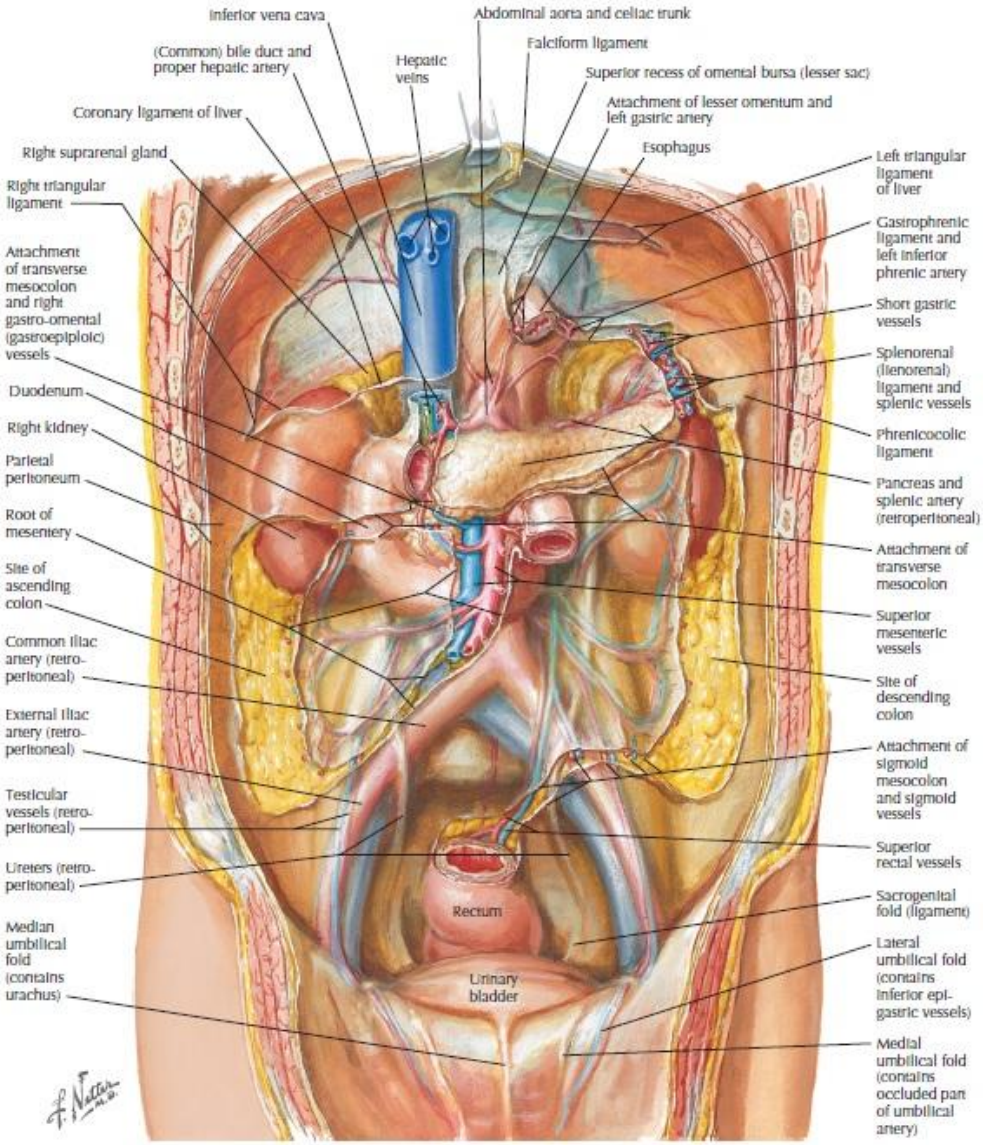

Fig. (١): Retroperitoneal organs **(Burkhill and Healy, ٢٠٠٠)**

Detailed evaluation shows that the extraperitoneal region, rather than being composed of amorphous mesenchyme, is distinctly demarcated by well-defined fascial planes (Fig. ٢). The extraperitoneal region is divided by the anterior and posterior layers of renal fascia known collectively as Gerota's fascia which is a dense, collagenous, elastic connective tissue sheath that envelops the kidney and perirenal fat. Its two layers fuse behind the ascending or descending colon to form the single lateroconal fascia, which then continues around the flank to blend with the peritoneal reflection forming the paracolic gutter **(Hureau J et al., ٢٠٠٤)**.