Exploratory laparotomy is an old but still efficient way to diagnose and eventually treat abdominal affection. In 2018 and the increase accessibility to real time imaging (ultrasonography) and transsectional imaging, the indications of this historic examinations have decreased but it still actuality. It is also the best way to acquire large biopsies of most of the abdominal organs. This examination has the unique advantages over other tests to allow direct visual and tactile examination and to allow direct therapeutic actions.

To be a valuable examination exploratory laparotomy must follow 3 cardinal’s rules:

1. Safe access + safe opening and closure, minimal risks associated with abdominal content exposure,
2. Thorough examination
3. Safe and extensive sampling

1 / Access
Exploratory laparotomy should grant full access to the abdominal cavity and its content. The access will be a long xypho-pubic laparotomy, midline incision over the midline. The access will be closed with suture of the aponevrosis, 5mm minimum “bites”, full thickness with a resorbable sutures providing 15 days of support as the *linea alba* will be considered healed after that time. In patient with delayed healing nylon or polypropylene in a monofilament sutures could be considered. Simple interrupted sutures or continuous pattern could be considered. Gentle hemostasis of the skin and subcutaneous incision as well as minimal dissection around the *linea alba* will be used to prevent wound complication/seroma formation

2 / Thorough Examination
Use of self-retaining retractor (Balfour’s retractors, Large wound ring retractors), use of large moistened abdominal swabs and the use of a scrubbed assistant will allow large exposition and retraction. Precise swab cunt before and after closure will be routinely done to prevent the risk of retained swabs. Moistening of the exposed tissues to prevent desiccations and adhesions formations will be used regularly. Thorough examination will be helped by the initial resection of the falciform ligament on its attachment along the *linea alba*. This is done using monopolar or bipolar cautery as parietal vascularization will be encountered.

The abdominal cavity is explored according a routine checklist to prevent any forgotten part:

a/ Abdominal wall and diaphragm: Direct visualization is usually possible with gentle traction, penetrating wound or peritoneal reaction will be reported.
b/ Liver and bile tract: After resection of the falciform ligament direct visualization of the liver is possible cranially with direct observation and gentle palpation of the liver lobes. Unless evidence of specific pathology systematic resection of the triangular ligament fixing the liver to the diaphragm (left lateral lobe) is not done routinely. The gall balder will gently expressed digitally to confirm patency of the drainage duct.
c/ Pancreas and spleen: the spleen is exteriorized and inspected, the pancreas is access on its right limb by ventral and medial retraction of the descending duodenum, the body and left limb are exposed after opening of the *omentum bursa* along the stomach greater curvature and ventral-cranial retraction of the stomach.
d/ Gastro-intestinal tract: the stomach is examined on its ventral aspect but also on its dorsal aspect on the left side. It is then palpated for any mass or foreign material. From the pylorus, the small intestine is
palpated and examined all along its length in the normal anatomic order (the surgeon will run the intestine) that will prevent any area unexamined. The surgeon will have to be familiarized with the duodeno-colic ligament fixing the ascending duodenum to the dorsal part of the meso-colon. In doing this examination the mesenter and mesecteric lymph nodes as well as the colic nodes and mesocolon are examined.

**e/ Urogenital tract and adrenal glands:** The left adrenal, left kidney, ovary and uterine horn and left ureter are examined by retraction ventro-medial of the descending duodenum (toward the left) using the meso-duodenum as a natural retractor to retract the rest of the GI tract, the spleen and omentum. The right adrenal, kidney, ovary, uterine and ureter are examined similarly using the descending colon as a retractor (retraction ventral, toward the right). During these retraction, the medial iliac lymph nodes left and right are palpated at the level of the branching of the external iliac arteries and veins on the vena cava and aorta. In case of possible cryptorchidism, the groove from the kidney to the ipsilateral inguinal ring is inspected for any trapped testis. Eventually the urinary bladder, uterus and prostate are located and examined. Urethral catheterization is indicated if urinary disorder is suspected. The hypogastric lymph node is plated in the retroperitoneal space on the midline just at the level of the pelvic inlet, dorsal to the urinary bladder neck.

**f/ Omentum and remaining lymph nodes:** the hepato-gastric nodes at the level of the lesser curvature and dorsal to the pancreatic body are also examined.

**3/Sampling:**

Liquid content: the urinary bladder and gall bladder could be sample preoperatively with syringe and needle for cytology and culture. The gall bladder could be preferably sample through a hepatic lobe (right medial or quadrate) to prevent bile leak.

Parenchyma: liver, kidney, pancreas or spleen: Samples will be collect for histology.

Spleenic biopsy is unusual, and the surgeon will have to balance the benefits of a mere biopsy with the indication of a radical splenectomy.

Culture and sensitivity and quantitative (copper) analysis might be required for the liver. All these tissues can be sampled with tru-cut biopsies (preferred method for the kidney). All but the kidneys will be samples with suture/fracture technique using 2-0 or 3-0 resorbable sutures.

Lymph nodes will generally be resected or biopsied with a sutured wedge for histology and culture/sensitivity.

Hollow viscus: small samples will be collected with great care to not crush samples. All the biopsies tract will be closed with simple direct apposition using fine (4-0, 3-0) resorbable sutures (usually polydioxanone), on round bodied needles, full thickness.

**4/ Additional considerations:**

Antibiotics are not always necessary for exploratory laparotomy and the author will encourage use of antiobiotic prophylaxis if non-septic process is expected, Bacteriology analysis is frequently required, the author will therefore hold on any antibiotics administration until the samples for bacteriology are all collected.

At the end of the sampling, the abdominal cavity should be free of any contamination/blood or effusion. Abdominal lavage is required in case of soiling/effusion and to help limiting desiccation/heat loss. Before closure of the cavity all irrigation fluids should have been removed (suction).

One of the benefits of exploratory laparotomy besides collecting samples is the possibility to achieve direct diagnosis and possibly treatment. On should not embark in such procedure if technically not able to
progress to therapeutic actions: for example, enterectomy in case of retained intestinal foreign body

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