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Innovation & surgery A fantastic voyage

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The first two issues of the e-World Journal of Minimally Invasive Surgery (e-WJMIS) have been widely acclaimed and ranked in the iBook store's top 10. We are now delighted to announce the release of the third issue of this electronic multimedia journal dedicated to technological innovations and state-of-the-art minimally invasive endo-laparoscopic surgery. In this issue, operative technique chapters have been superbly illustrated by narrated high definition video footage and schematic drawings.

This very comprehensive issue is enhanced by a “pearl” lecture by Dr. Thomas M. Krummel, MD, entitled “Chance favors the prepared minds”. Thomas Krummel is a world-renowned surgeon and scientist at the Stanford University School of Medicine with an unrivaled pioneer innovative spirit awarded with numerous achievements. In addition, Dr. Krummel is a fascinating figure able to condition his speech with acumen, wise and philosophical insights.



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In this authoritative lecture, Dr. Krummel enraptures the audience by depicting the path scientists should tread on. The University of Strasbourg was named after Louis Pasteur, whom Dr. Krummel considers a role model – he celebrates his multiple achievements by emphasizing the “scientific process”, experience-based techniques for problem-solving, learning as well as discovering. Dr. Krummel presents what he considers some of the keys to success in surgery, which are to never forget the motivations animating the scientific spirit, avoid ossification of the brain, think out of the box, apply the right effort, listen cautiously to the environment, and enhance one's senses. To conclude the issue, an off-season cultural escape takes you to the Strasbourg Christmas market. You will be introduced to the romantic glitter of this European City with its snow-capped rooftops and the animation and mesmerizing scents of Christmas time. We hope that this virtual visit will spark the desire to travel to Strasbourg, the world's Christmas capital.



Thomas M. Krummel, MD
Stanford University School of Medicine

At the time of his appointment as Dean at the University of Lille, Louis Pasteur, former Faculty member at the University of Strasbourg, remarked “In the field of observation, fortune favors only the prepared mind”. While there are many examples, Pasteur’s own work best exemplifies this maxim. He fundamentally laid to rest the theories of spontaneous generation, advanced both science and utility, and ushered in the preservation of beer, wine and milk through a process known to this day as pasteurization. In a parallel fashion, he saved the French silk industry by solving the riddle of parasite attacks on silkworm eggs. His work in immunology and vaccination paved the way for the eradication of cholera, anthrax and rabies.

Pasteur’s work was so profound and grounded in use-inspired basic research that it formed the foundation for a book entitled Pasteur’s Quadrant – Basic Science and Technological Innovation. In his own words, Pasteur said “Imagination should give wings to our thoughts, but we always need decisive experimental proof, and when the moment comes to draw

conclusions and to interpret the gathered observations, imagination must be checked and documented by the factual results of experience” – as true today as they were 150 years ago.

To this day, we need minds that remain prepared. Too often conventional wisdom creates sloppy “group think”. Nobel laureate, Paul Lauterbur, commented “You can write the entire history of science in the last 50 years, (...) in terms of papers rejected by Science and Nature”. Contemporaneously, we know that profound insights invariably begin with an unsolved problem -- whether a piece of music that does not work or a scientific observation that conflicts with existing dogma. Archimedes “Ah Ha” moment began with the thorny problem of calculating the king’s gold crown composition without destroying it. The insight during a relaxing moment in the bath is worthy of reflection.

Perhaps one of the most innovative companies in the world, Minnesota Mining and Manufacturing Company (3M) has now hardwired creativity policies, which

include a flexibility attention policy and a rule whereby 15% of one's work time may be devoted to speculative new ideas but must be shared with colleagues. These two simple policies have created 75 years of consistent innovation.

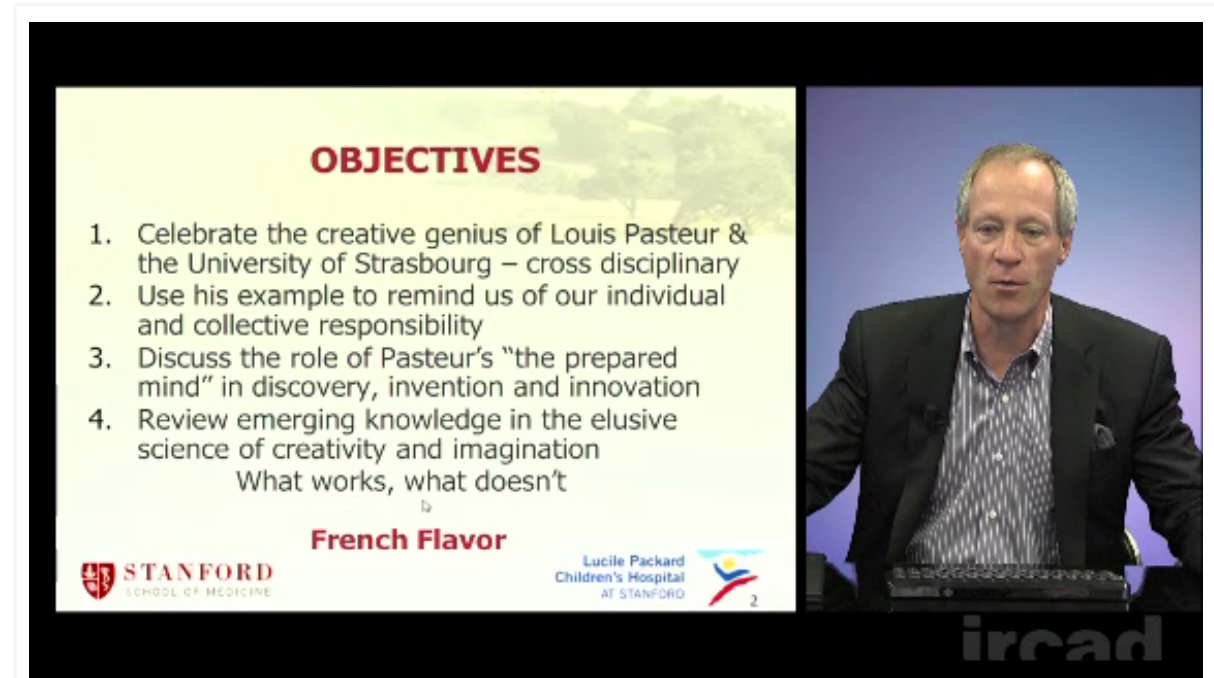
In the end, universities are privileged places for discovery, invention and innovation. Done correctly, a learning environment, cross-disciplinary interaction, hard work and playful time will continue to lead to important insights. Ultimately our minds are like parachutes, they function only when open.

Chance favors the prepared mind

Thomas M. Krummel, MD

Emile Holman Professor and Chair
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Thomas M. Krummel's lecture



1.1.Sentinel node

1.2.Liver tumor

1.3.Esophagus



Original Articles

Browse through original articles taken from the eWorld Journal of MIS

1.1. Near-infrared laparoscopy for lymphatic mapping and sentinel node identification



Ronan A Cahill, MD, FRCS

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While much importance is placed on the resection of a minimum number of lymph nodes as both a determinant and an indicator of curative loco-regional resection for colon cancer, there is currently no routine means of identifying the most relevant nodes in vivo during laparoscopic operations prior to the specimen being sent for pathological examination. Near-infrared (NIR) laparoscopy is an emerging technology that harnesses the energy within an extended electromagnetic spectrum beyond that of white light illumination. NIR energy can penetrate adipose tissues without causing destructive heat dissipation and is capable of exciting certain substances to fluoresce by their absorption of energy at one specific wavelength and their re-emission of energy at a different, longer wavelength. Indocyanine Green (ICG) is one such agent capable of induced fluorescence that has previously been proven



Ronan Cahill interviewed by Bernard Dallemagne

both safe and efficacious as a colonic tattoo and that is composed of molecules of sufficiently small diameter to allow their rapid, passive diffusion into lymphatic vessels within the intestinal wall after its injection into a submucosal plane. An NIR laparoscope (systems are currently available from Olympus, Karl Storz and Novadaq Corporation) is capable of performing as a standard white-light laparoscope but also, by switch activation, as a NIR excitation energy source with filter-selected imaging of the altered-wavelength light energy back-emitted from the fluorescing substance (a 'fluorophore', in this case ICG).

This clinical study, relying on new technology being used in this manner for the first time, has determined that the first-order nodes lying in direct sequence with the primary tumour can now be confidently identified by NIR fluorescence after peri-tumoral ICG injection during laparoscopic operation for colonic cancer without any prior tissue dissection or disruption of tissue planes. While, at present, all patients undergoing this additive imaging modality in our unit continue to undergo conventional radical resection of the primary tumour with en bloc lymphadenectomy of its regional mesocolic nodes, the next step in this ongoing investigative process is to develop means of optically ascribing the oncological status of the nodes detected to be of relevance by the NIR mapping technique. If a significant positive predictive correlation between the pathology of the sentinel nodes and the pathology of the standard nodal dissection is determined, it could subsequently be proposed that focus on the first draining nodes alone could be sufficient to indicate tailored operative extent stratified by the loco-regional extent of the disease at the time of presentation and operation. While this latter issue will obviously require rigorous

evaluation, at present the modality is already proving useful as a road-mapping technique to demonstrate the most relevant lymph node basin given the site of the primary cancer (particularly relevant for tumours located at the hepatic and splenic flexures) and to identify potential cases with aberrant, extra-anatomical lymphatic drainage.



Clinical case

FURTHER READING

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1.2. Laparoscopic liver resection with laparoscopic bipolar radiofrequency device (laparoscopic



Laparoscopic liver resection using Habib™ 4X

The improvement in surgical techniques has allowed the development of laparoscopic liver resection over the last decade. Various devices have been designed and developed to minimise blood loss during transection of the liver parenchyma laparoscopically over the last decade. In spite of this, intraoperative bleeding remains the main cause of conversion to laparotomy in order to control haemorrhage and achieve liver resection. Here, we describe the laparoscopic Habib™ 4X, a bipolar RadioFrequency (RF) device and the technique of laparoscopic liver resection with this device.

The laparoscopic Habib™ 4X (LH4X, Angiodynamics Inc., USA), consisting of a 2X2 array of needles arranged in a rectangle, uses bipolar RF energy. The LH4X measures 45cm in length with a protected insulated area to allow 5cm in length for RF. The device can be introduced via a 10-12mm laparoscopic port and is connected to a 500-kHz generator (Model 1500X, Angiodynamics Inc. NY, USA) which produces up to 250 Watts of RF power. The system also consists of a pneumatic foot pedal used to turn RF energy on and off. On connecting the device and switching on the generator, the RF power setting defaults to 125 Watts and this can be modified according to the user's experience and to the thermal requirement of the individual tissue types.

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1.3. Ablative and resective therapies of Barrett's esophagus



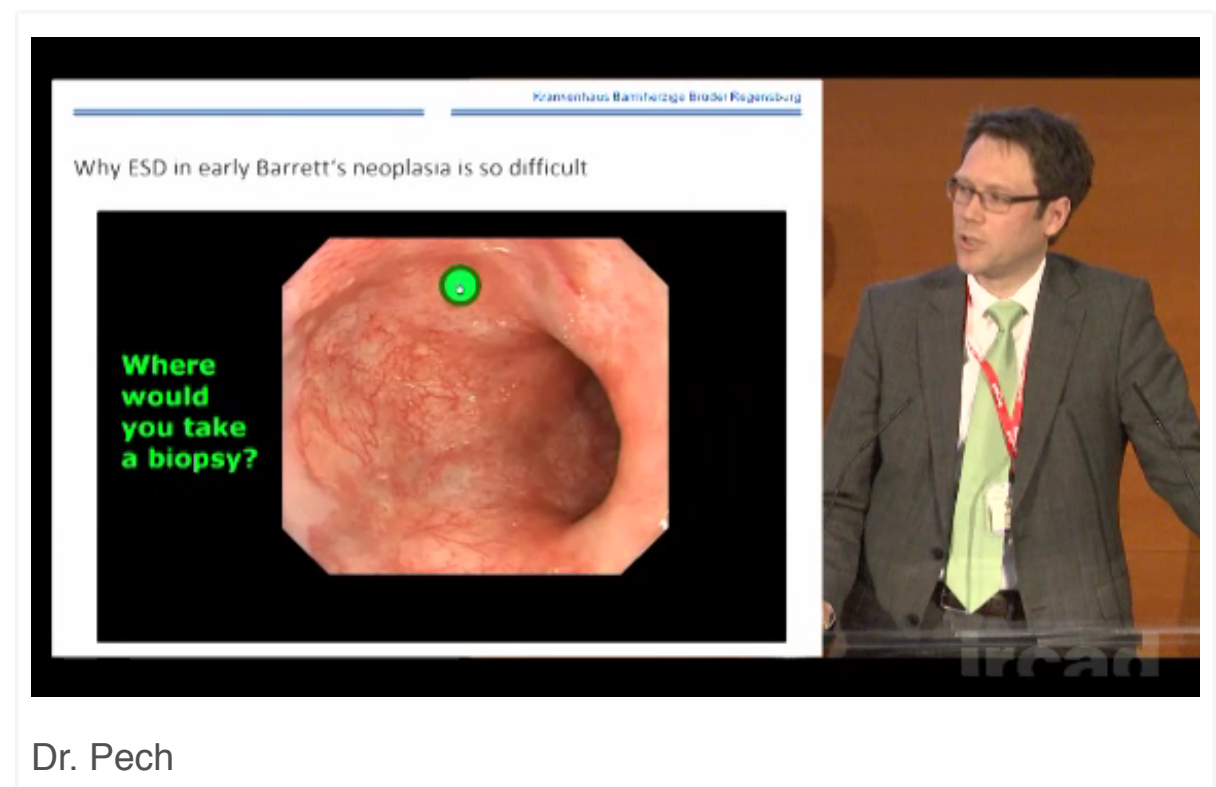
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Treatment of Barrett's associated neoplasia has dramatically evolved over the past years. It was a mere 10 years ago that esophageal resection started to be regarded as the treatment of choice for patients with high-grade intraepithelial neoplasia and mucosal adenocarcinoma arising in Barrett's metaplasia. However, because of the high mortality and morbidity rate associated with surgical therapy, there has been a search for less invasive treatment methods.



High-grade intraepithelial neoplasia (HGIN) and early Barrett's cancer:

It has been shown that there is almost no risk of lymph node metastasis in patients with HGIN and adenocarcinoma limited to the mucosal layer (T1m1-4), and consequently, endoscopic




Dr. Pech

1.3. Ablative and resective therapies of Barrett's esophagus


treatment can be considered to be curative in these lesions [1,2]  However, in cases of deep submucosal invasion, lymphatic (L1) or blood vessel infiltration (V1), esophageal resection should be performed since there is an increased risk for lymph node metastasis in these cases [1,2] 


There are different ablative treatment methods available. The major disadvantage of all ablative methods such as Argon plasma coagulation, photodynamic therapy and radiofrequency ablation is that histological staging is not possible as in after endoscopic resection (ER). After ER, the pathologist can provide exact information about the infiltration depth, differentiation grade and lymphatic invasion. Subsequently, only ER allows risk stratification of treated patients.

The success rates of endoscopic treatment of HGIN and mucosal adenocarcinoma are excellent, as underlined by the largest series published to-date for endoscopic treatment of Barrett's neoplasia: 349 patients with HGIN (n=61) and with mucosal carcinoma (n=288) were included [3] .

Endoscopic treatment was highly effective with a remission rate of 96.6%. However, during a median follow-up of more than 5 years, metachronous and recurrent neoplasia were observed in 21.5% of cases. Most patients were re-treated successfully and long-term complete response was achieved in 94.5% of cases. The overall 5-year survival rate in all patients was calculated as 84% and did not significantly differ from the survival rate of the average German population with the same age and gender distribution. The ablative treatment of the remaining non-dysplastic Barrett's epithelium was

able to significantly reduce the rate of metachronous HGIN or cancer.

As a result, the current treatment of choice in patients with Barrett's neoplasia should be a 2-step approach: firstly ER of all visible neoplastic lesions, and secondly ablative therapy of the remaining non-dysplastic Barrett's epithelium with radiofrequency ablation in order to reduce the recurrence rate or rate of metachronous neoplasia [4] .

Endoscopic submucosal dissection (ESD) is a new technique where larger areas of neoplastic tissue can be resected en bloc with dedicated knives. However, first results from Western centers are disappointing with complete resection without tumor-positive margins in 38.5% of cases only [5] .

Endoscopic resection of early neoplasia in Barrett's esophagus followed by radiofrequency ablation of the remaining Barrett's epithelium has become the treatment of choice in most countries. Long-term results for endoscopic treatment in a large group of patients are now available and are proving that ER is safe and highly effective with long-term complete remission rates of more than 94%. All visible lesions should be treated by ER for histological confirmation and staging of the neoplastic lesion.

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2.1. Rectum

2.2. Esophagus

2.3. Spleen

2

Operative Techniques

Keep abreast of changes in surgical techniques and emerging technologies to offer patients the most up-to-date procedures.

2.1. Preservation of neurovegetative plexuses in male patients during laparoscopic rectal cancer surgery



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The main objective of rectal cancer surgical treatment is to completely resect the rectum away from the tumor (1 to 2cm of distal margin, 1 to 2 mm of lateral margin), by removing the entire mesorectum in order to analyse at least 12 lymph nodes [1] . For cancers of the middle and lower thirds of the rectum, the oncological resection also requires an “en bloc” mesorectal excision along with a preservation of the fascia propria of the rectum to prevent the risk of contamination and local recurrence [2,3] .

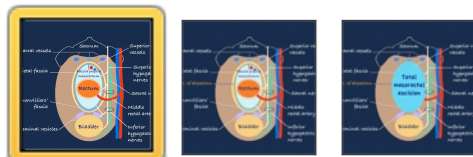
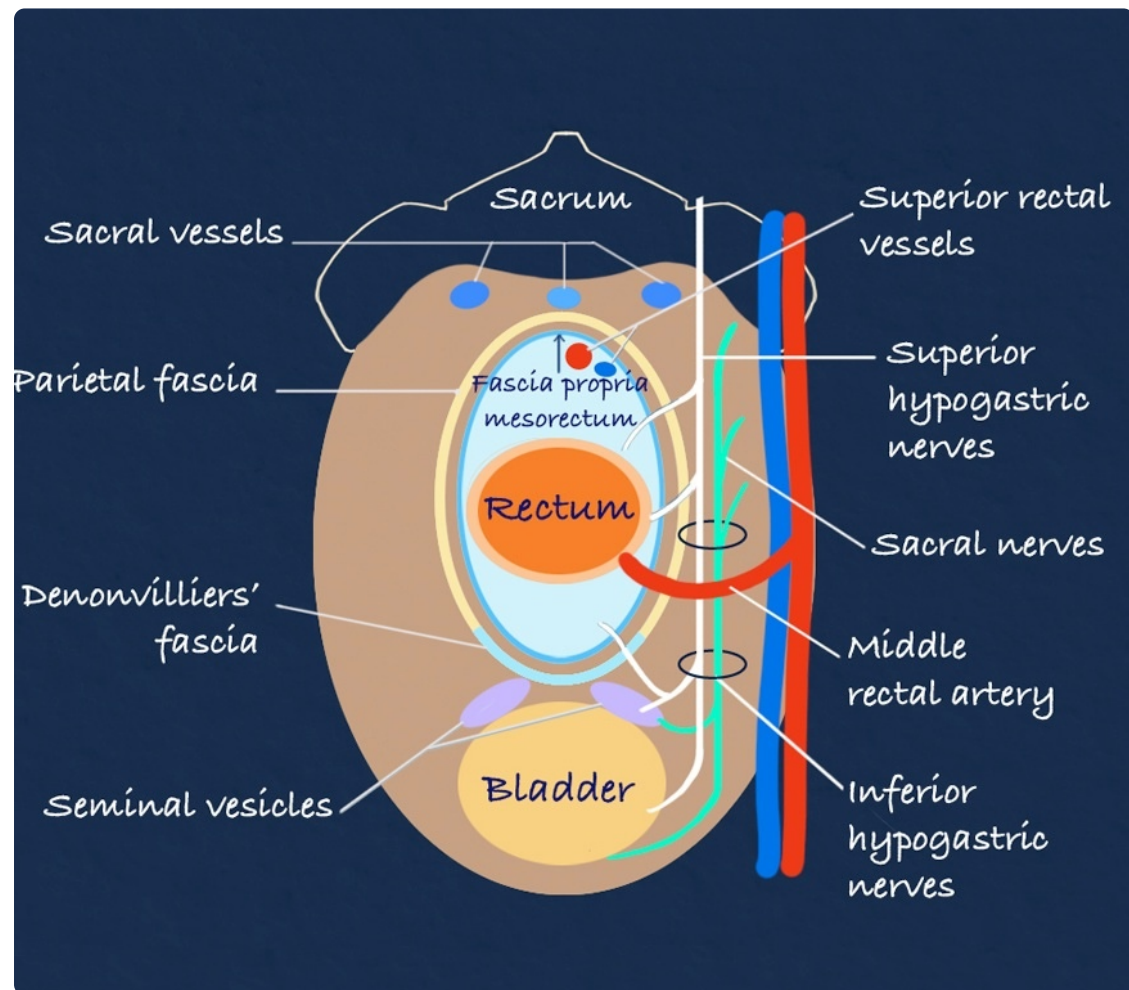
The oncological surgical procedure has increasingly become an extensive resection procedure, which aims to preserve adjacent anatomical structures in order to improve functional results and allow for a better quality of life. The rationale of this approach, although previous studies revealed that the incidence of cancer cell involvement along the pelvic autonomic nerves ranged from 4 to 14%, is a recent immunohistochemical study by Tadahiko Masaki et al. [4] which concluded that cancer cell involvement was not seen in and around the pelvic autonomic nerves, justifying the preservation of autonomic plexuses and nerve rami during rectal cancer surgery.

It is now a challenge regularly reported in the literature. It aims to reduce the risks of urinary and sexual sequelae that used to be so frequent during rectal cancer procedures [5-9] .

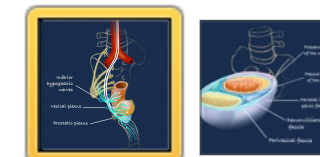
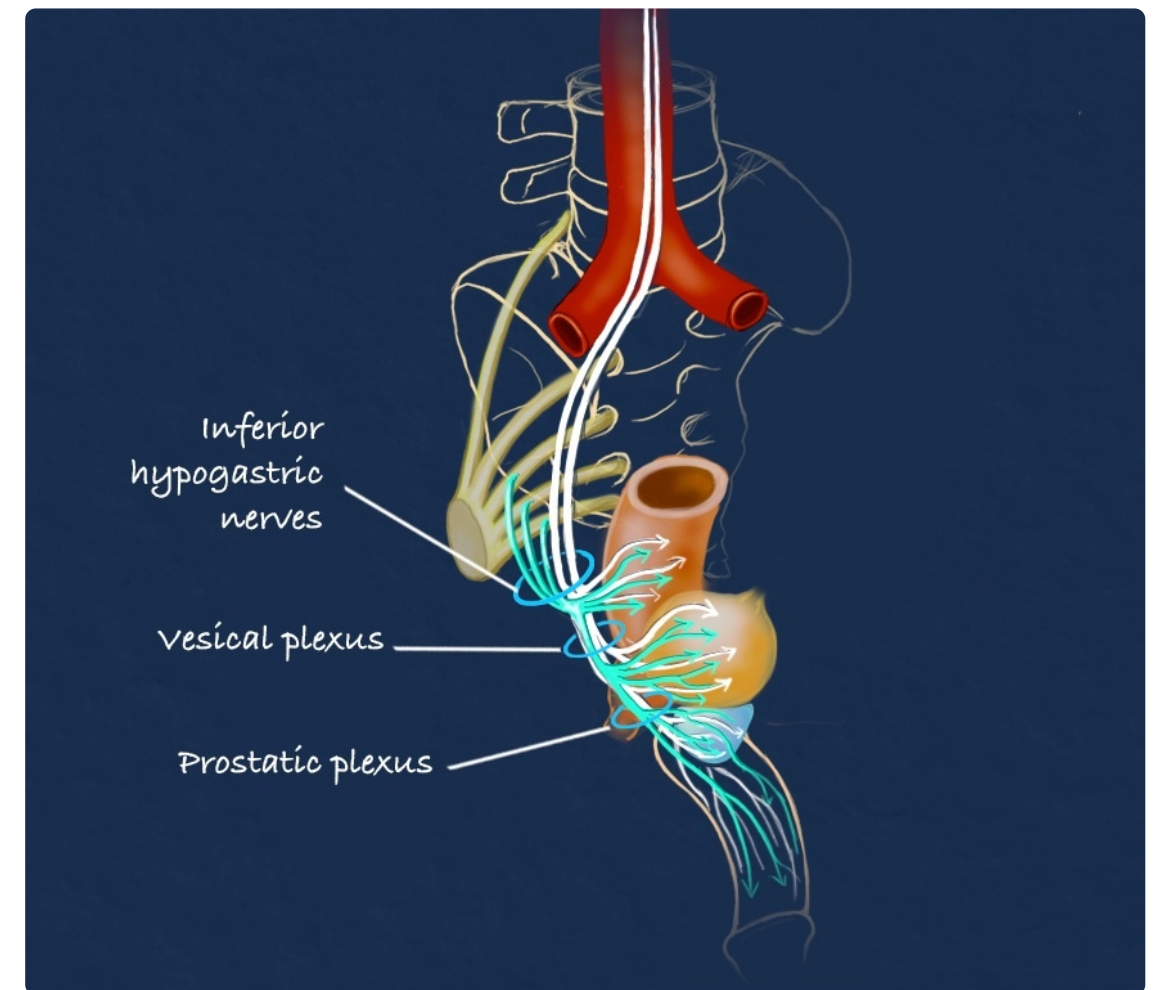
It is mandatory to perfectly know the embryological anatomy and to surgically identify anatomical structures [10] . The difficulty of the procedure lies in the necessity to divide lymphatic ducts in contact with or embedded in nerve rami. Fortunately enough, the

embryology of nerve plexuses is of great assistance to us [11,12] . As a matter of fact, anatomical structures are surrounded by fasciae covering and protecting nerve structures at the level of the sigmoid mesocolon and of the mesorectum. Only a few nerve rami cross the fasciae and will be divided.

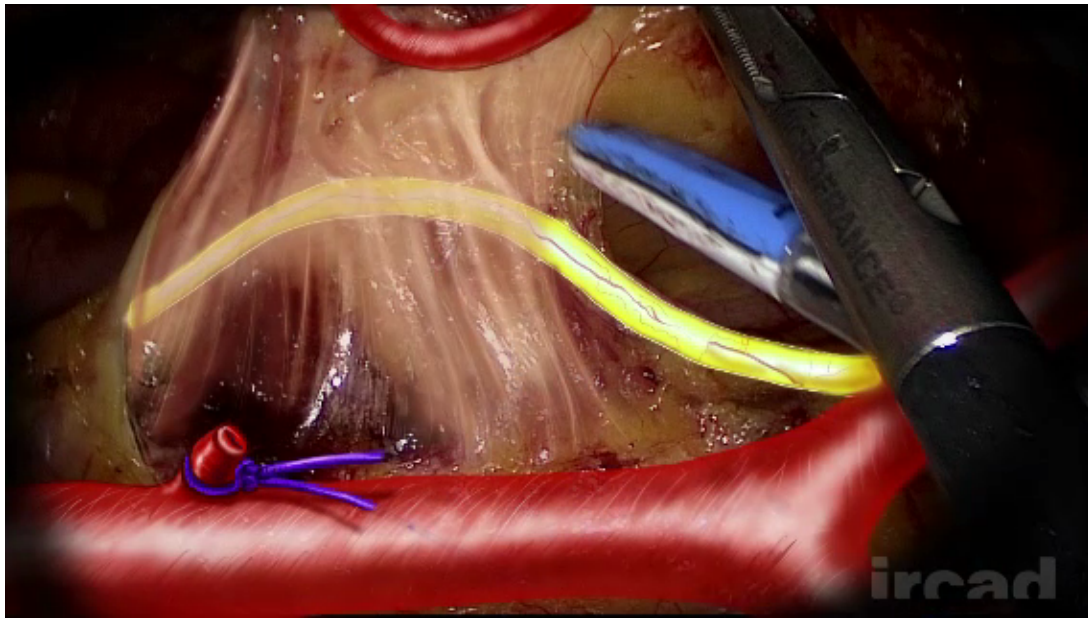
Schematics: Sagittal view of pelvis in male patients



Functions



Dissection of the Inferior Mesenteric Artery (IMA) and aorta



Dissection around the origin of the IMA and along the anterior aspect of the aorta

As soon as the peritoneum has been incised from the anterior aspect of the promontory until the lateral edge of the duodenojejunal flexure (Treitz's flexure), the retroperitoneal and retrovascular space are opened using carbon dioxide pressure which induces a pneumodissection, improved by anterior traction of the inferior mesenteric vascular axis.

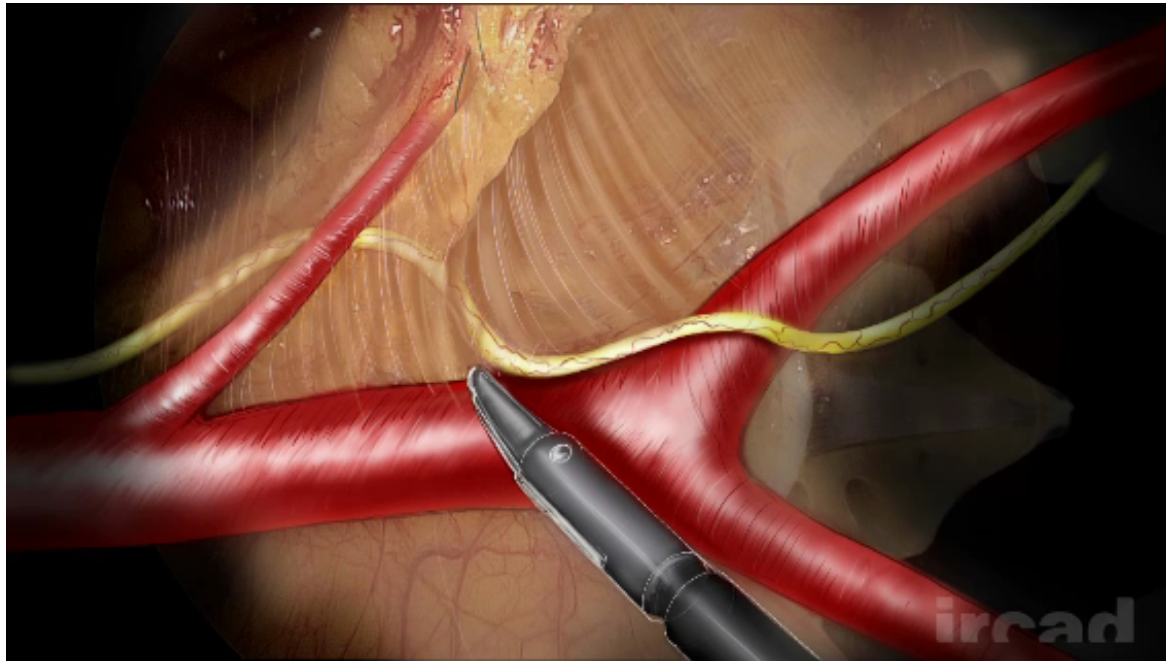
This mesenteric axis is then dissected by following the vascular sheath on its posterior aspect from the promontory until the origin of the IMA. Close to the origin, dissection is more delicate because of a densification of cellular fibrotic and lymphatic structures surrounding the IMA proximal to the aorta.

Dissection should not be performed in contact with the aorta where nerve rami of superior mesenteric plexuses course. Dissection should be performed in contact with the IMA 1 or 2cm from its

insertion on the aorta. The safest technique is to skeletonise the artery as the vascular sheath has been opened and sympathetic nerve rami heading to the inferior mesenteric axis have been divided. Division of the IMA is performed as soon as the skeletonisation has been achieved by means of the Ligasure™ vessel-sealing device or between clips.

After IMA dissection, the distal stump is grasped, lifted and turned to the left in order to progressively free its posterior and left lateral aspects from the surrounding fibrotic sheath. Elements of the superior hypogastric plexus will be parietalised on the left side of the aorta. More caudally, towards the iliac bifurcation, these elements have already been parietalised during the opening of the retroperitoneal space opposite the promontory.

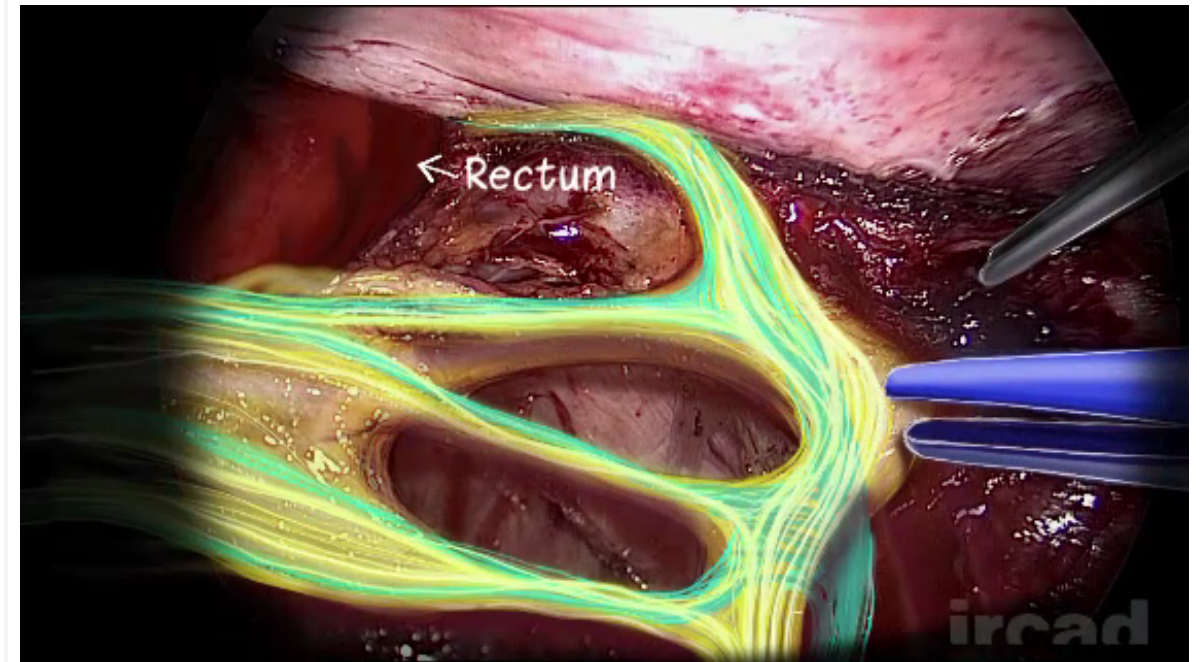
Dissection of the upper pelvis



Superior hypogastric plexus at the level of the pelvic brim

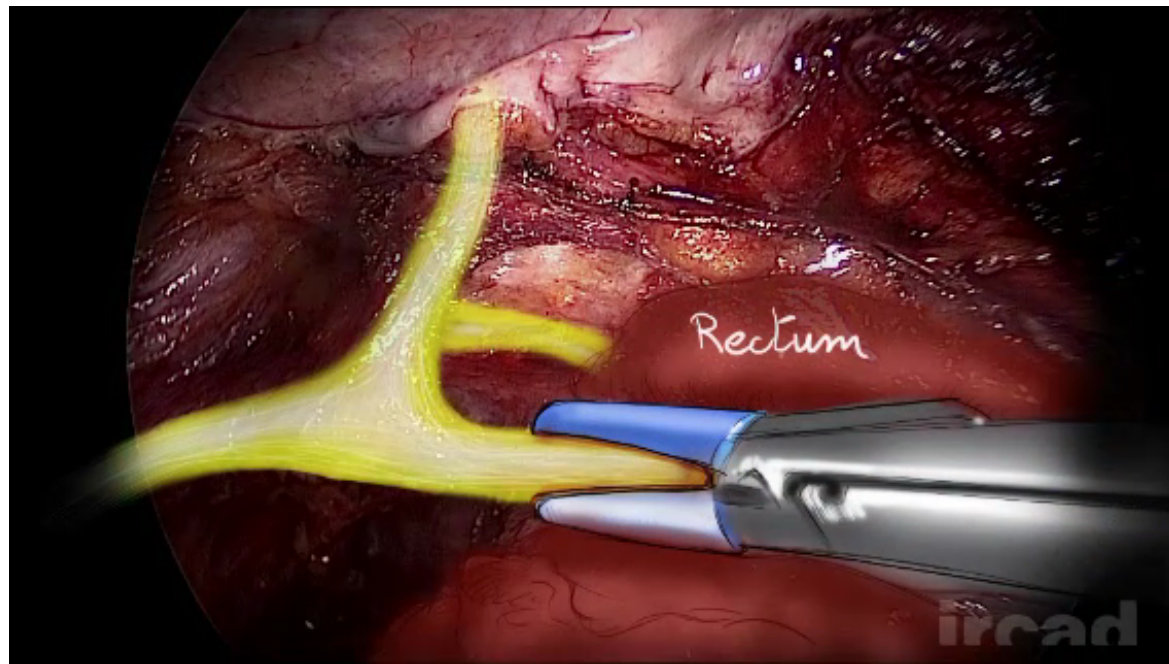
This dissection is conventionally easier and less dangerous on the right as the angle of vision is better and the instruments remain parallel to the dissection plane. One should however pay attention to inferior right hypogastric nerve trunks, which can be too mobile, and their medial path could well represent a risk during dissection. Embryologically, parietal posterior and lateral fasciae cover these plexuses. The dissection began at the aortic bifurcation and continued directly on the rectal fascia propria. Dissection should consequently be continued between the presacral fascia posteriorly and the lateral fasciae. The use of peanut swabs to apply traction and atraumatic counter-traction will allow for the opening of the presacral plane (the “Holy Plane” according to RJ Heald).

Lateral pelvic dissection



Right rectal branches of the inferior hypogastric plexus

It is one of the most dangerous ones for nerve plexuses. They are perfectly protected by lateral pelvic fasciae and originate in visceral branches, which cross the interfascial space[11,12] (). Pelvic plexus injuries could potentially be due to medial tenting of the plexus as the rectum is retracted medially. Medial traction on these nerve branches can angulate sacral branches (S2, S3, S4) as well as the sympathetic pelvic nerve trunk.



Left rectal branches of the inferior hypogastric plexus

The nerves from the pelvic plexus to the rectum can be mobilised on the right and left sides to a length of 10-15mm by sharp dissection between the fascia propria of the rectum and the sidewall fascia plane and they are found about 2cm below the point where the peritoneum reflects lateral to the rectum.

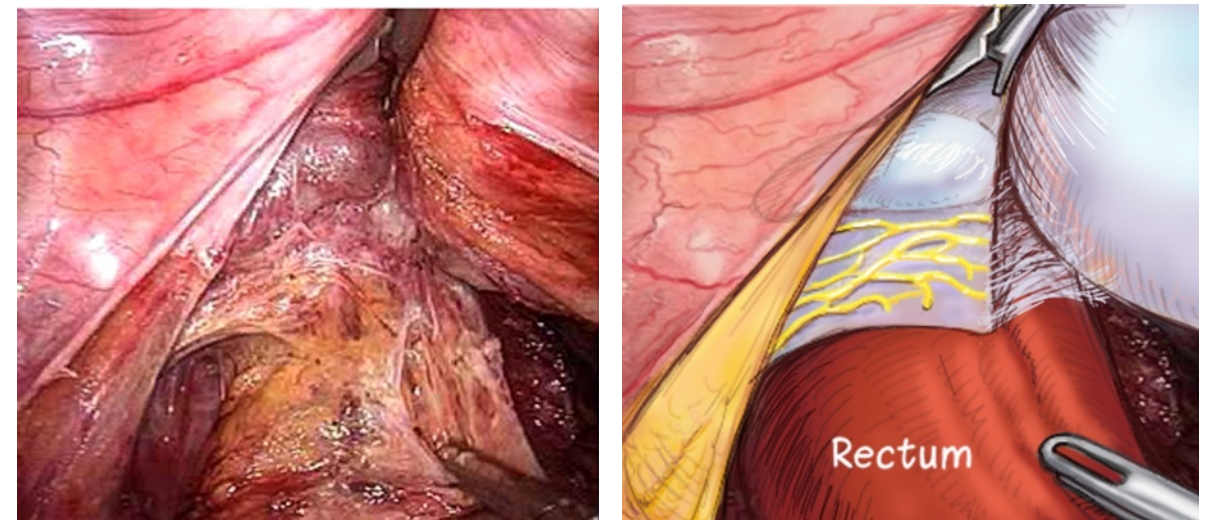
Lesions of the nerve plexuses, including cuts and burns, cause erection problems in men along with a damaged urinary function. Elective and atraumatic dissection of nerve branches limits this risk.

Low anterior rectal dissection

The anterior dissection of the low rectum is another dangerous area to perform a dissection of the genitourinary nerve plexuses. The dissection plane comes closer to Denonvilliers' fascia. It is at this level that lesions of genitourinary branches are directed anteriorly to Denonvilliers' aponeurosis, which should be respected. The bladder and the prostate gland were innervated from the anterior portion of pelvic plexus localized laterally to the seminal vesicles.

For posterior and limited anterior T1 or T2 lesions, the dissection plane can be located posteriorly to Denonvilliers' aponeurosis.

For advanced anterior lesions, dissection must be performed anteriorly to the aponeurosis. In this case, there is a maximum risk, especially after irradiation. The posterior aspect of the aponeurosis is easily exposed as soon as Douglas's pouch has been opened on the posterior aspect of the bladder. More caudally, the use of specific retractors (Endo-Retractors from Storz) greatly helps in the reproduction retraction principles according to RJ Heald (3D retraction).



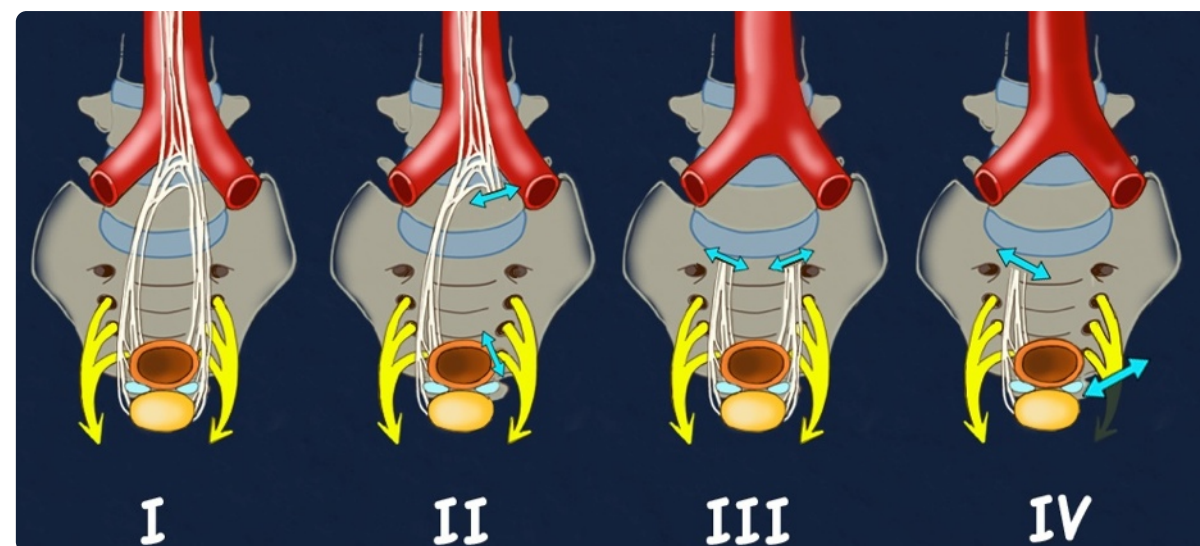
Nerves rami branches anterior to Denonvilliers' fascia

Conclusions

The four dangerous areas for nerve injury during rectal TME are at the IMA origin, at the superior hypogastric plexus where the formation of the two hypogastric nerves takes place, at the pelvic plexus, and posterior to seminal vesicles.

The HD video camera allows an exceptional vision of the anatomical structures. Our videos showed that the integrity of the pelvic plexuses and hypogastric nerves after rectal extrafascial excision (EFE) in TME can be preserved. The splanchnic nerves from the pelvic plexus that supply the rectum can be mobilised to a length of 10-15mm, identified and safely divided, leaving the pelvic plexus intact following the EFE of the rectum. The hypogastric nerves, which are enveloped in a layer of parietal fascia, also remain intact. When TME is accurately performed, the risk of genitourinary dysfunction is very low. In a conventional oncological open rectal resection prior to a TME procedure as described by RJ Heald, the rate of urinary dysfunction ranges from 30 to 70% and male sexual dysfunction ranges from 20 to 60% (inability to ejaculate or impotence or both). Morita et al. demonstrate [6] the impact of sexual dysfunction dependant on the level and number of plexus nerve injuries, concluding that anejaculation occurs after injuries of the superior hypogastric plexuses and impotence injuries of the inferior hypogastric plexus. Recently, laparoscopy with robotic assistance was proposed to perform better preservation of autonomic pelvic nerves. Until now, no data has proven better results even if recently Jeong Yeon Kim has pinpointed an earlier recovery in voiding and sexual function (3 months vs. 6 months) [13]. Unfortunately, there is no information about the laparoscopic technique of dissection that is

Plexus nerves Injuries: Morita classification [6]



usually performed using an ultrasonic device in the standardised laparoscopic technique versus monopolar dissection using a robotic device. The conclusion may be different depending on the technique of dissection used (e.g., more traction on nerves when using an ultrasonic technique).

Many factors other than nerve preservation have a role in genitourinary function, which explains the difficulty to evaluate sexual dysfunction. Preservation of body image (without stoma, definitive and temporary) combined with an adequate dissection technique as put forward by ourselves, will reduce the dysfunction rate.

A good anatomical knowledge of the pelvic anatomy is essential even if this anatomy can be different among patients as far as running patterns of nerves and volume of nerves branches are concerned. Identification may be uneasy, particularly after radio-chemotherapy, in obese patients, in narrow pelvis and in previous pelvic surgery [14].



In recognition of his pioneering contributions as an influential surgeon and mentor in minimally invasive techniques, Joël Leroy won the prestigious 2013 SAGES Pioneer in Surgical Endoscopy Award in April 2013 in Baltimore, United States.

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2.2. Round table: short esophagus - myth or reality: from personal experience to objective diagnosis and management



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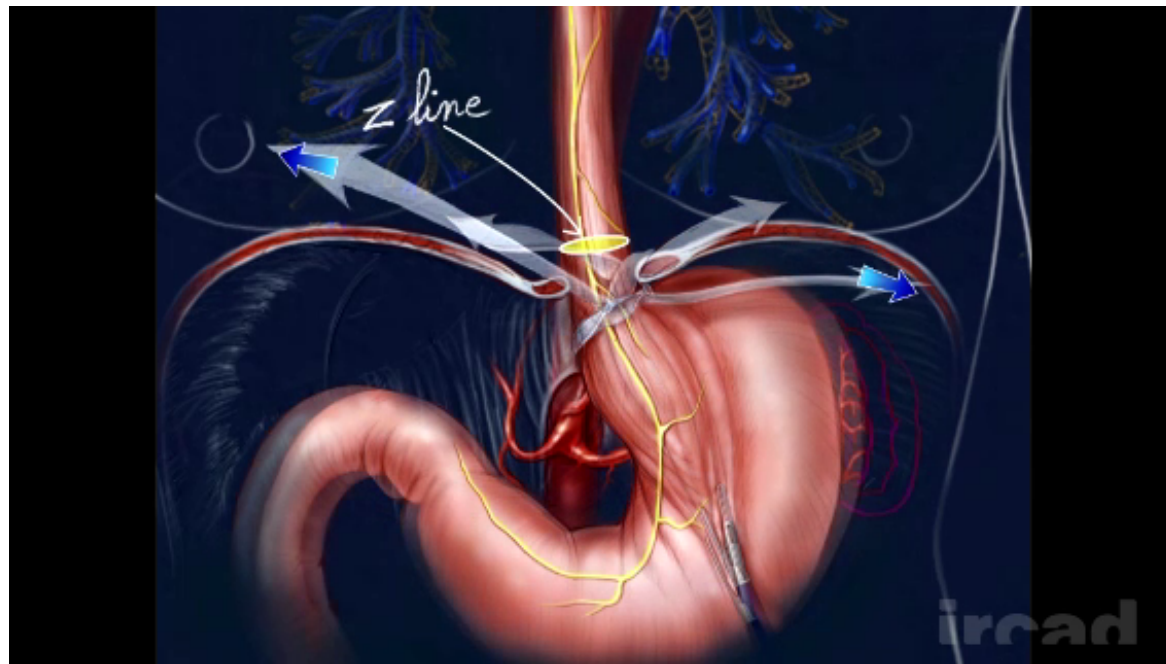
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Anatomic shortening of the esophagus can compromise the ability to perform an adequate antireflux repair by placing the repair under undue tension. In these patients, a gastropasty will lengthen the esophageal tube by creating a “gastric neo-esophagus” and allow tension-free construction of a fundoplication around the gastric tube and placement of a wrap into the abdomen.

The diagnosis of short esophagus is not easily made pre-operatively, although 5 to 10% of patients undergoing surgery for GERD will have one [1,2] . Although certain indicators of the severity of GERD give rise to this possibility, anatomical shortening remains an intraoperative diagnosis. Patients with long-standing GERD, Barrett’s disease, esophageal strictures or a history of failed anti-reflux procedures are particularly predisposed [3] .



Nathaniel Soper & Lee Swanström interviewed by Bernard Dallemagne



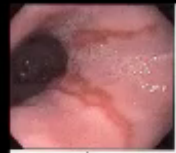
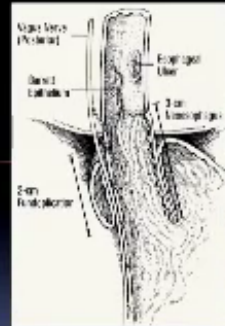
Short esophagus: intraoperative management


It must be emphasized that 70 to 80% of these patients can be appropriately managed with extensive mediastinal mobilization of the esophagus. The dissection is carried out up to the level of the inferior pulmonary vein, and sometimes higher, in order to gain maximal length. Nevertheless, up to 20% of these patients will require an esophageal lengthening procedure in order to maintain their anti-reflux valve in the abdomen.

In 1957n, Collis proposed the gastropasty to address the problem of the shortened esophagus [4] . Originally, the procedure was performed through a thoraco-abdominal incision. Since its introduction, there have been many modifications of the Collis gastropasty. It has been performed through a variety of incisions in the chest and in the abdomen.

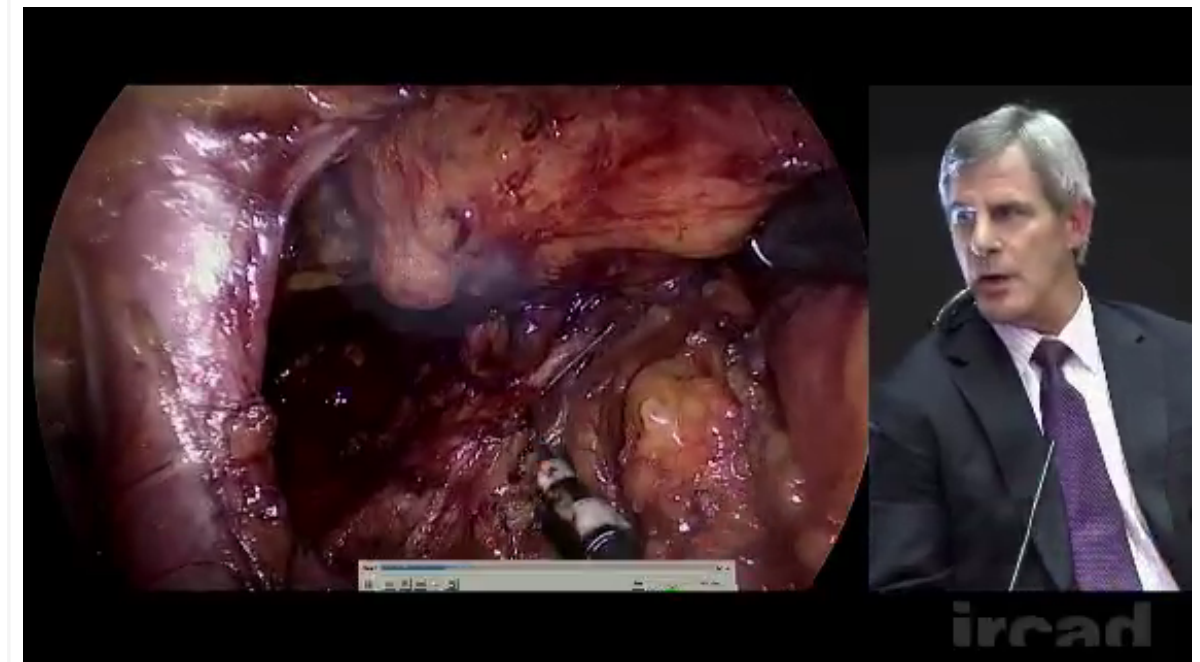
Results:

- 10/91 - 8/99 = 978 lap funduplications
- 32 (3.3%) Collis procedures
 - 12 PEH
 - 9 strictures
 - 14 redo
- 31 (97%) symptom improvement
- no recurrent herniation
- 9/21 (43%) abnormal 24 hr pH








Collis nissen: postoperative management and results




Clinical case








The first minimally invasive Collis gastroplasty was described in 1993 using the combination of a right-sided thoracoscopic gastroplasty with a laparoscopic fundoplication [5]  Johnson and Hunter subsequently introduced a totally abdominal minimally invasive approach using an endoscopic circular stapler [6] 

The circular stapler was used to create a window below the angle of His to insert a linear cutting stapler in order to create the neo-esophagus.

With the introduction of roticulating staplers, a simpler technique became possible, the stapled wedge gastroplasty using the roticulating stapler.

The transabdominal stapled wedge Collis gastroplasty is inspired by the technique described by Terry et al. [7] 

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2.3. Urgent laparoscopic splenectomy for acute thrombopenia (1000 platelets/mm³)



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Acute thrombopenia may represent a significant vital risk for the patient. It requires a rapid investigation in order to define whether medical treatment may solve the problem or to decide if surgical splenectomy is required.

In this clinical case, confusion was among the presenting symptoms, and MRI was performed to rule out an intracranial hematoma. All the attempts to control the bleeding with medical therapy failed with a platelet count (1000 platelets/mm³) only up to 10,000. Decision was made to remove the spleen.

In this scenario, the surgical team is confronted to the two following problems:

1. the management of an enlarged spleen that must be removed without any capsular rupture in order to prevent any postoperative splenosis
2. the management of potential bleedings.

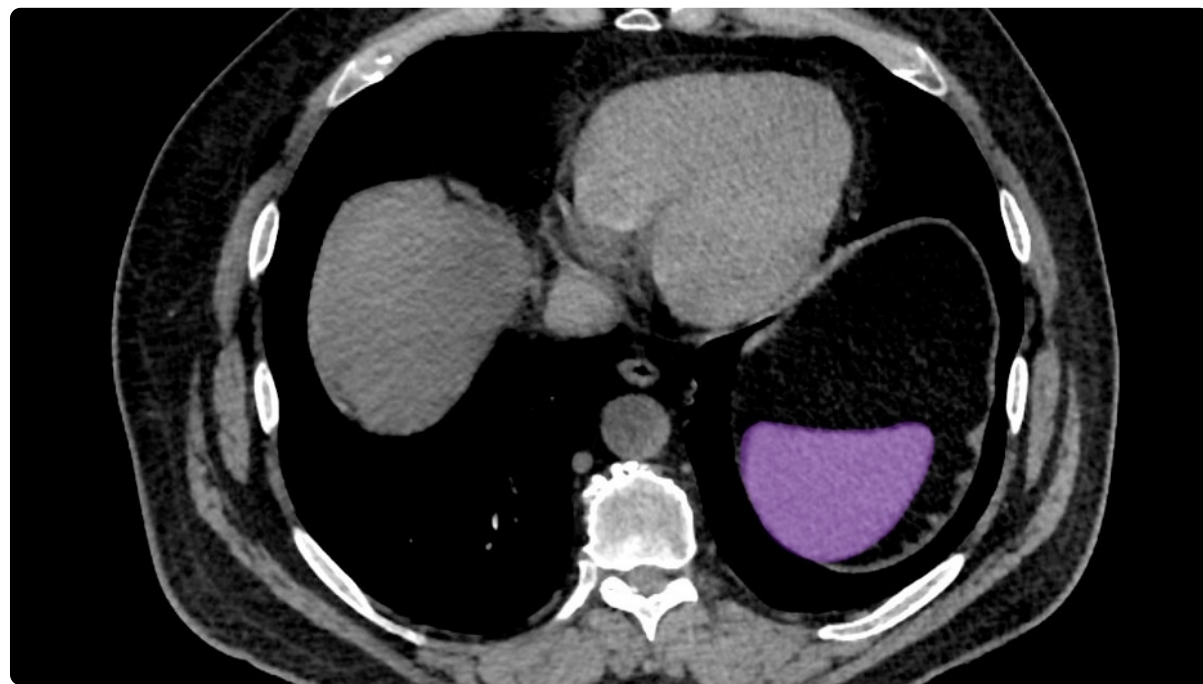
Surprisingly, most of these patients do not have an abnormal clotting time but only a low platelet count. Today, the therapeutic strategy consists in avoiding any preoperative platelet transfusion, even with a low platelet count, and to plan platelet transfusion at the end of the surgical procedure. In this particular case, intraoperative bleeding was nil as shown in the video.

Consequently, the patient was only transfused by two platelet concentrates. Five days postoperatively, the platelet count was over 100,000/mm³ confirming the success of the surgical treatment.

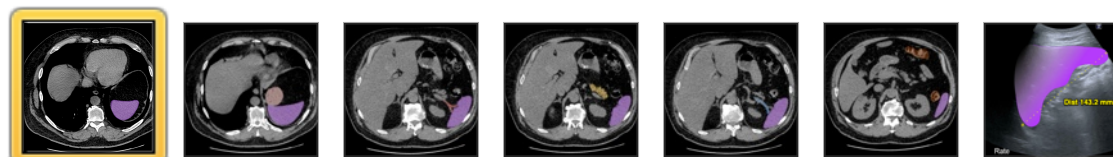
2.3. Urgent laparoscopic splenectomy for acute thrombopenia (1000 platelets/mm³)

A 51-year-old man is admitted for an acute thrombopenia (1000 platelets/mm³) associated with hematomas and several mucosal hemorrhages. He is unresponsive to treatment (platelet transfusion, immunoglobulins). The morphological exam demonstrates a 16cm spleen enlargement. A laparoscopic splenectomy is decided upon. The patient's weight is 125kg and his BMI is 31.

Preoperative imaging

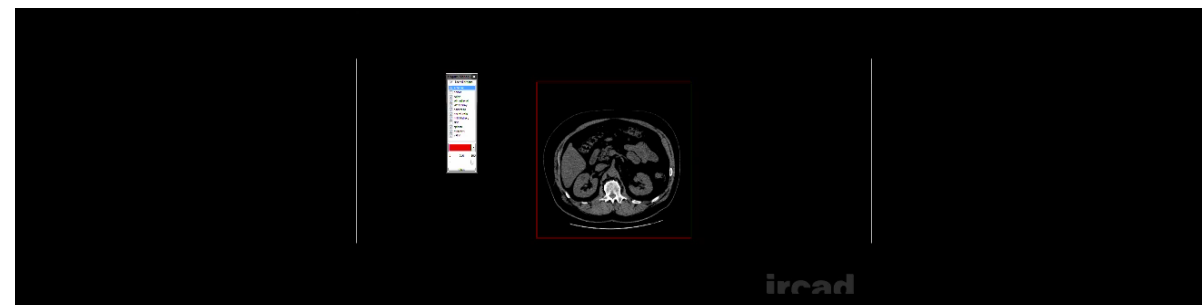


Spleen's upper pole

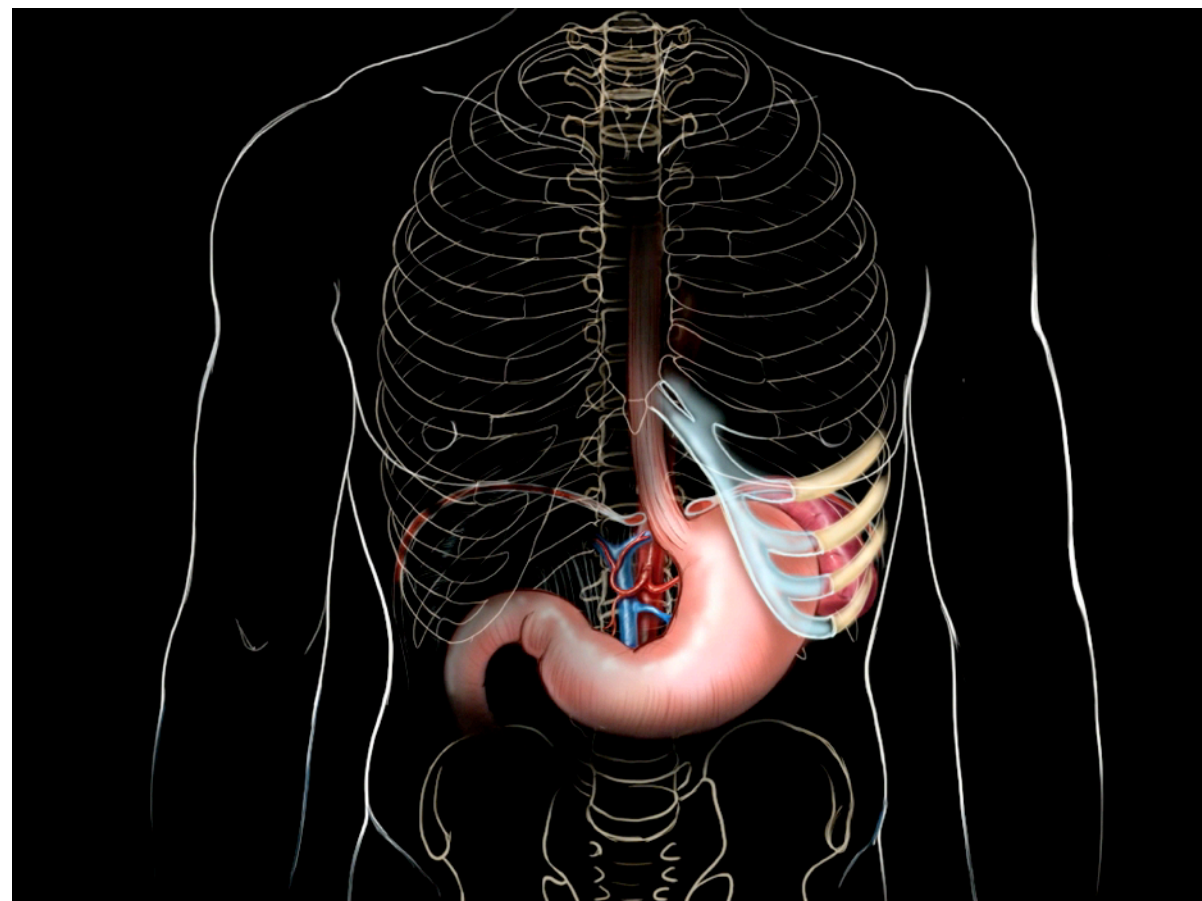


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3D reconstruction

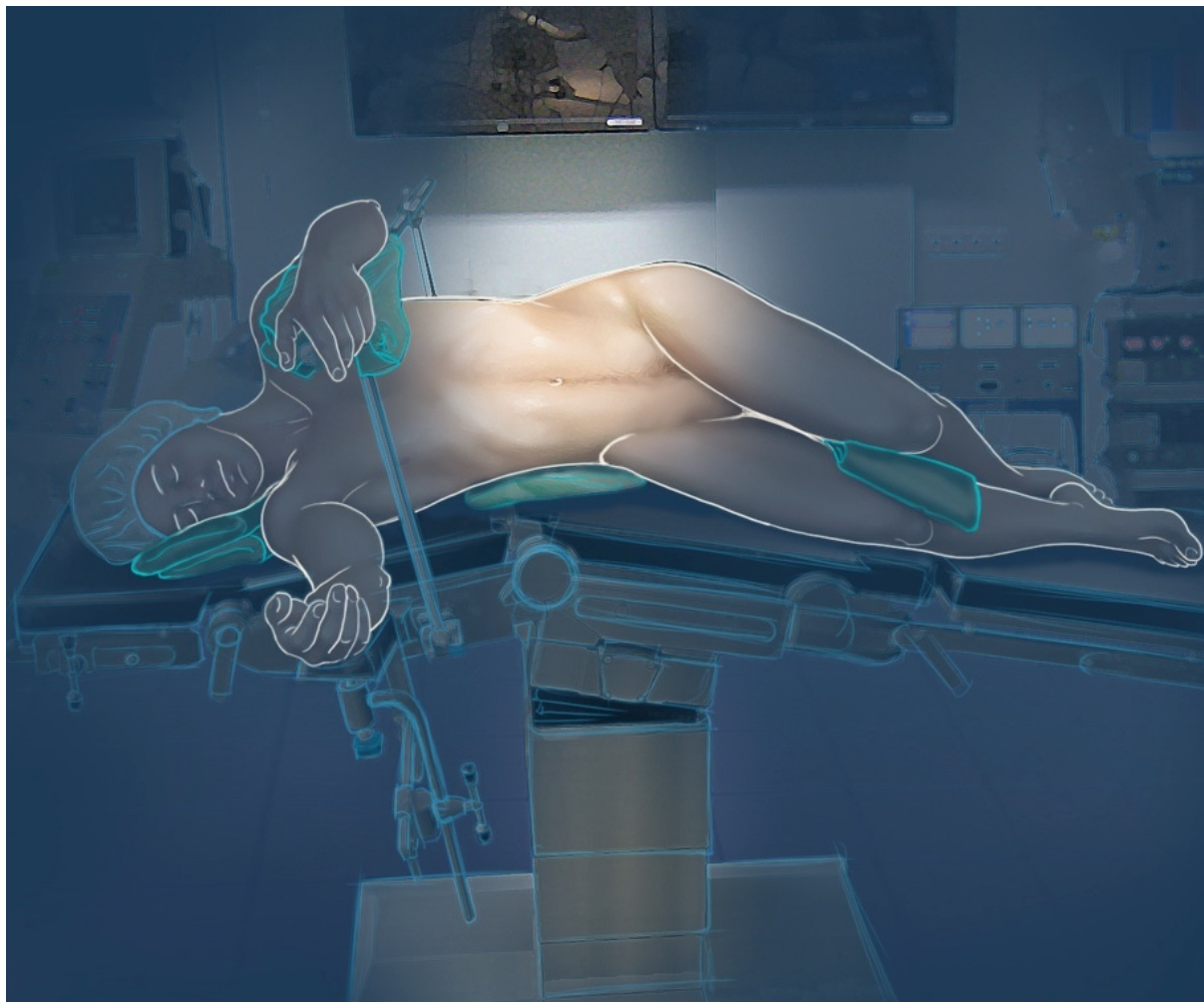


Radiological underevaluation of the size of the spleen



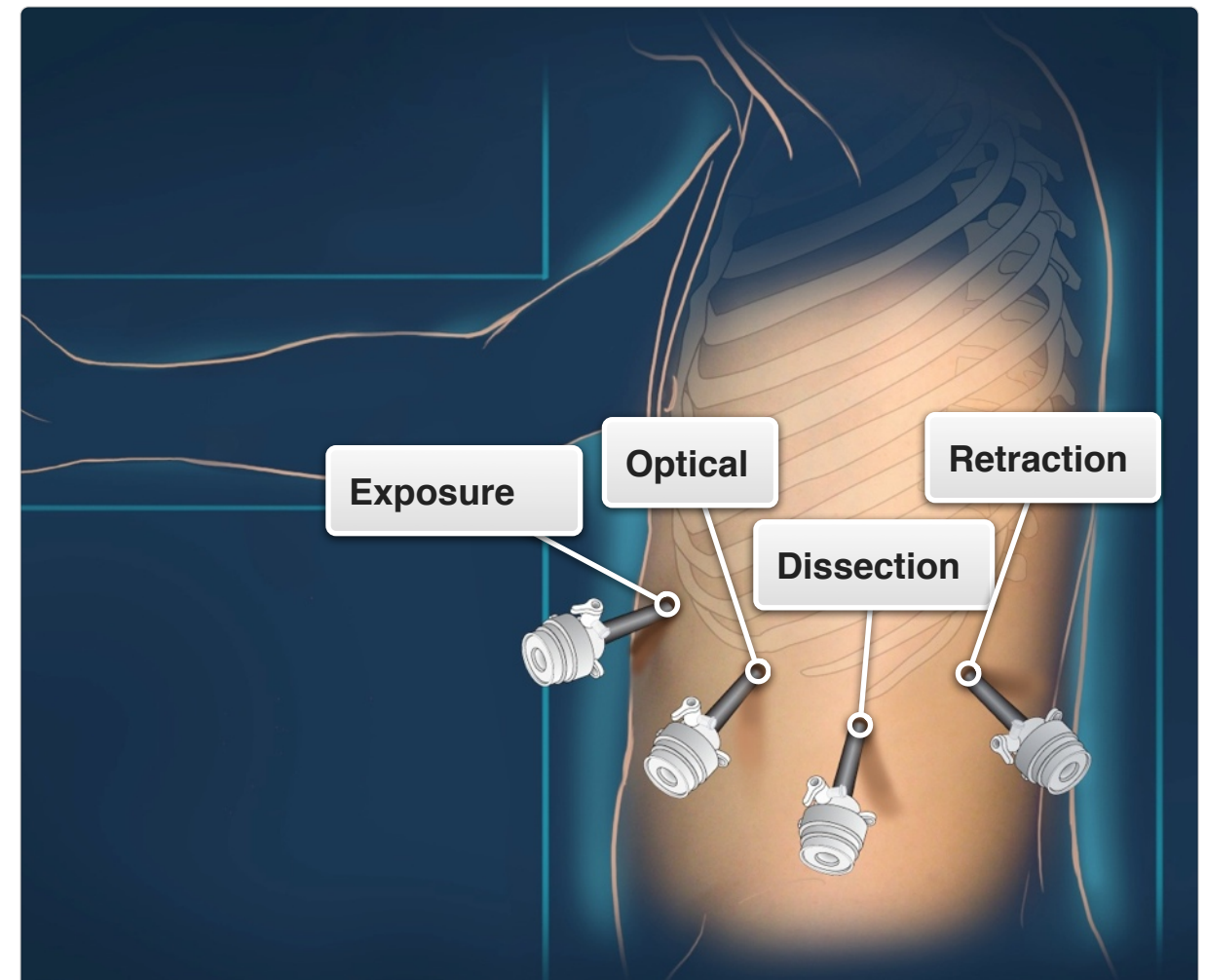
Patient set-up

Right lateral decubitus



Ports

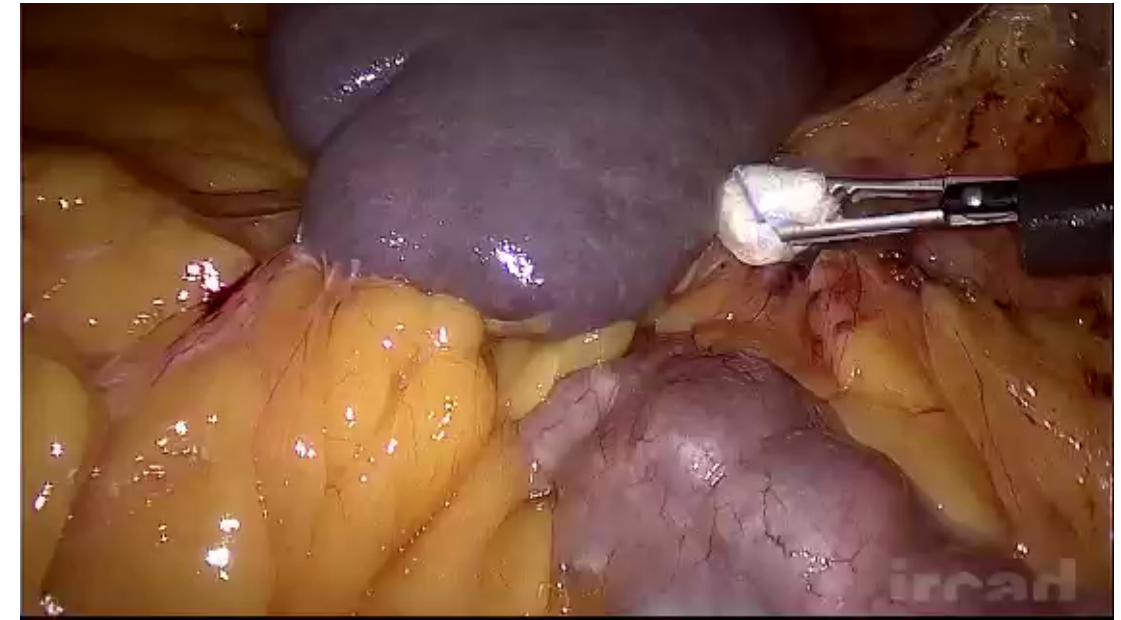
Four 10mm ports are introduced on the anterior axillary line and on each side 7cm underneath the costal margin; the first one is introduced using a direct approach (open access), and the fourth port is positioned posteriorly at the inferior border of the 12th rib.



Technique

1. INFERIOR POLE OF THE SPLEEN
2. ACCESS TO THE PANCREAS
3. SPLENIC ARTERY
4. SPLENIC VEIN
5. SHORT GASTRIC VESSELS
6. POSTERIOR FREEING
7. EXTRACTION

1. Inferior pole of the spleen



Dissection of the spleen's lower pole after mobilization of the splenic flexure, using the Ligasure™ system to prevent any hemorrhage.



Option 1 Clipping of lower pole artery

2. Access to the pancreas

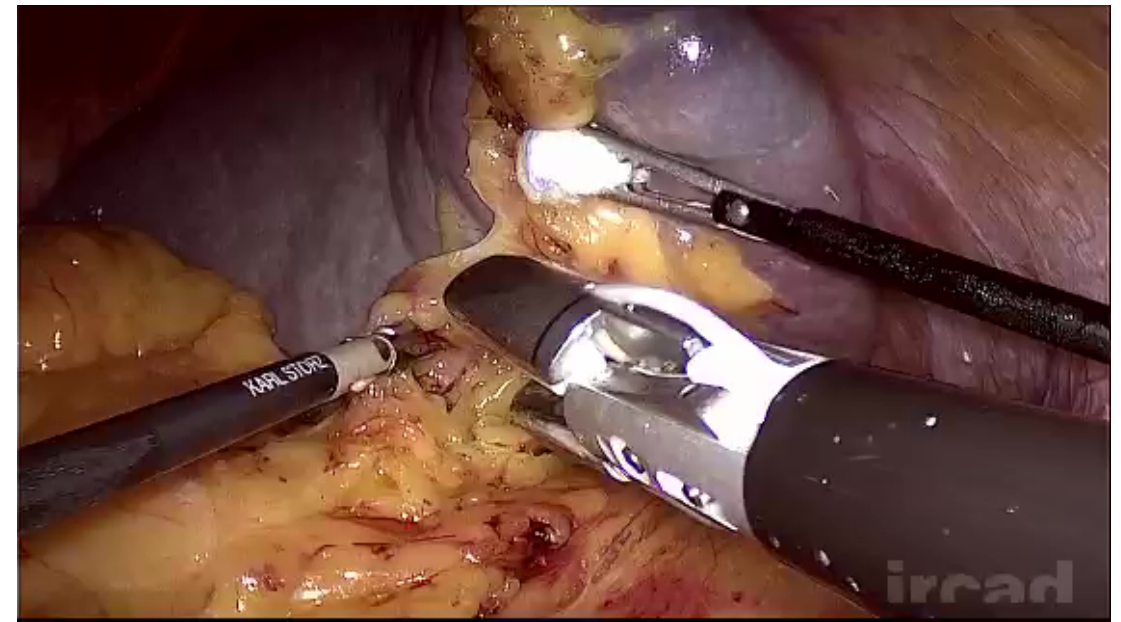


Mobilization of the superior border of the pancreas to access the splenic pedicle

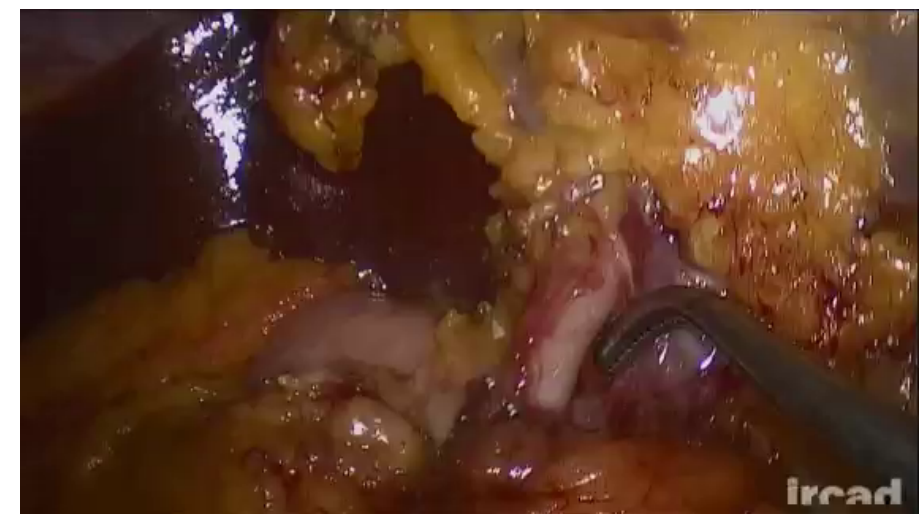


Option 2 Control of polar pancreatic artery, vascular control of arteries by means of clips

3. Splenic artery

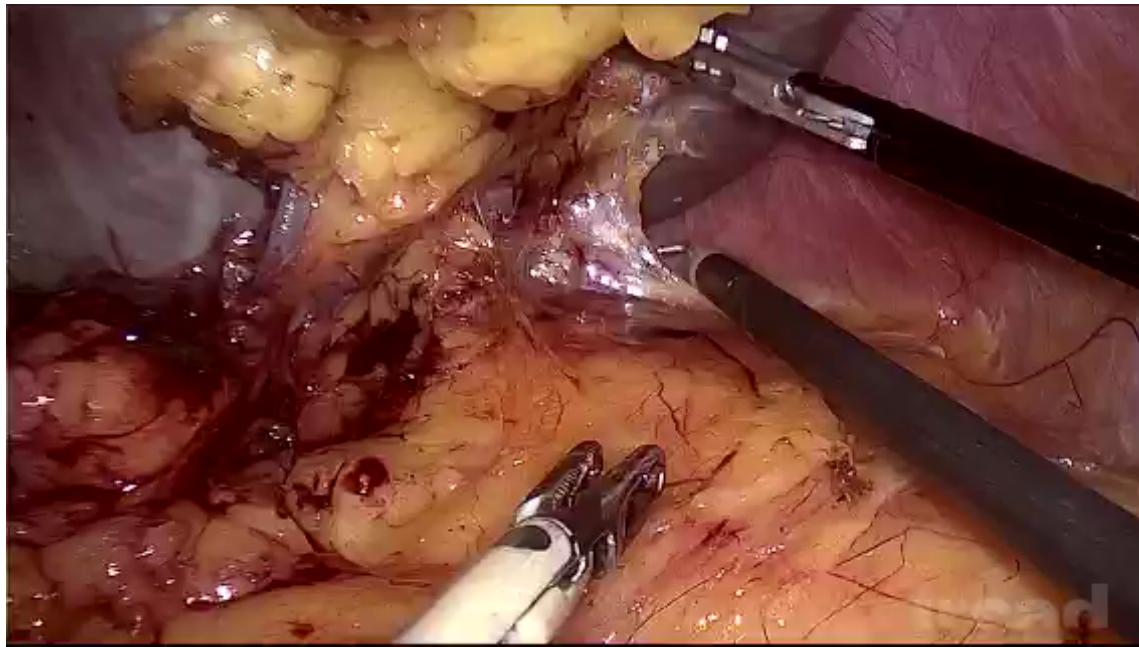


Dissection & division of splenic arteries beyond their division by means of the Ligasure™ device

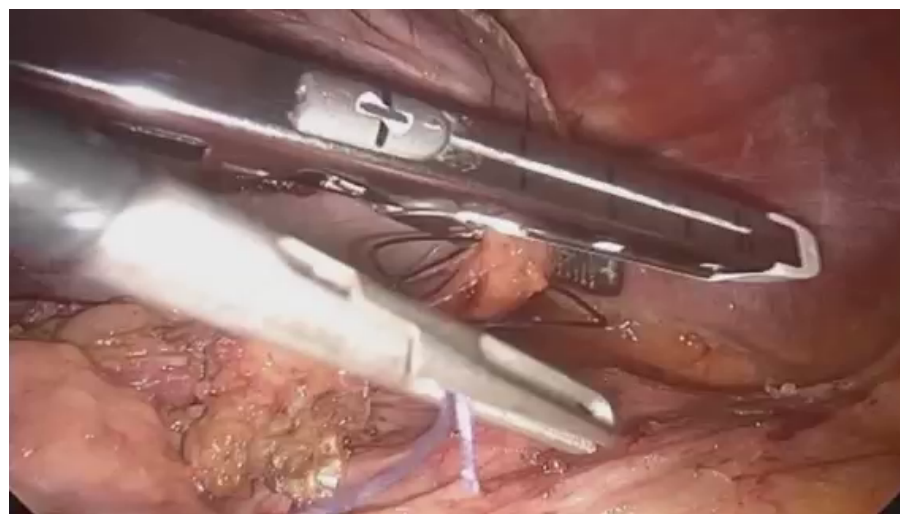


Option 3 Vascular control by means of stapling

4. Splenic vein

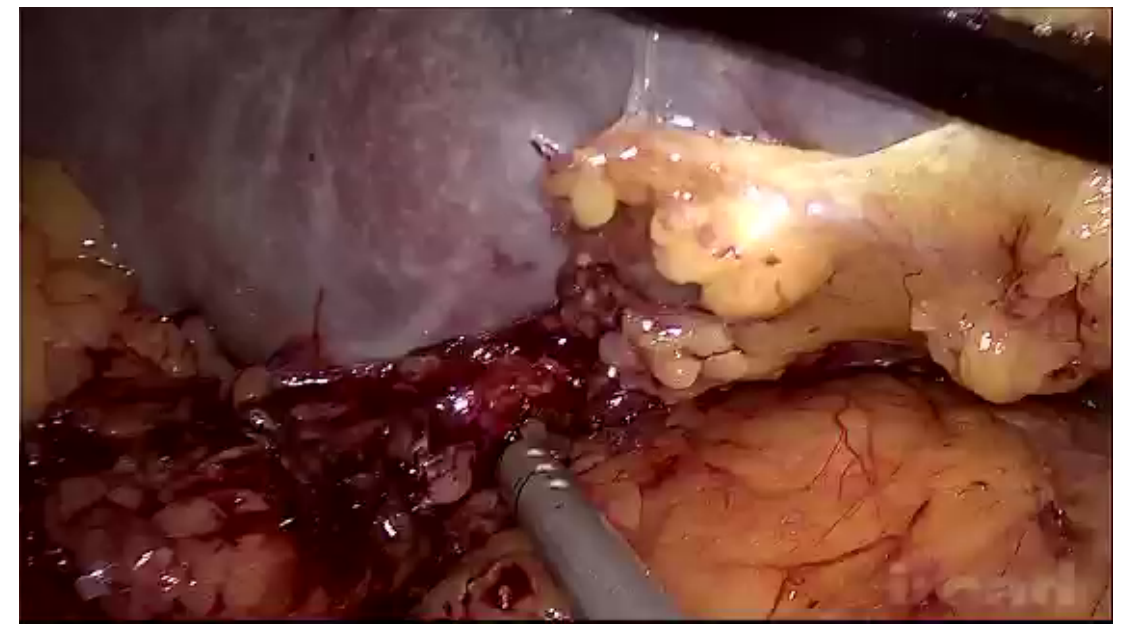


Dissection, clipping & division of the splenic vein identified by a suture

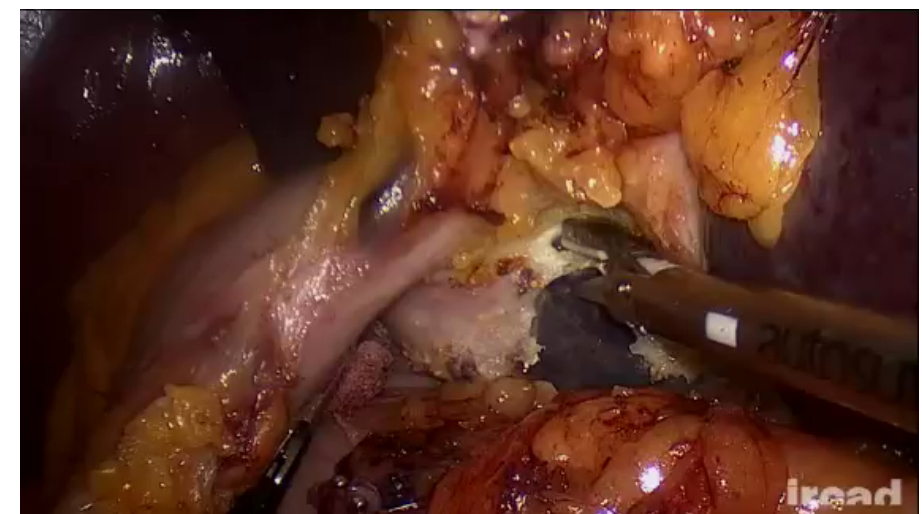


Option 4 Stapling of the pedicle

5. Short gastric vessels

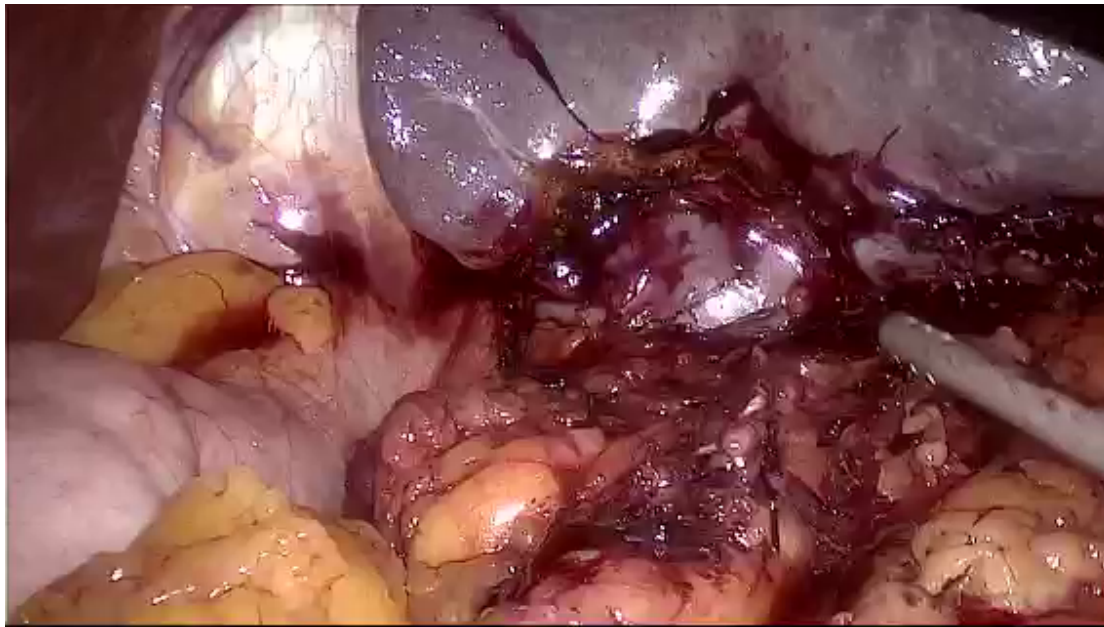


Mobilization of the greater curvature of the stomach and ligation of short gastrics vessels



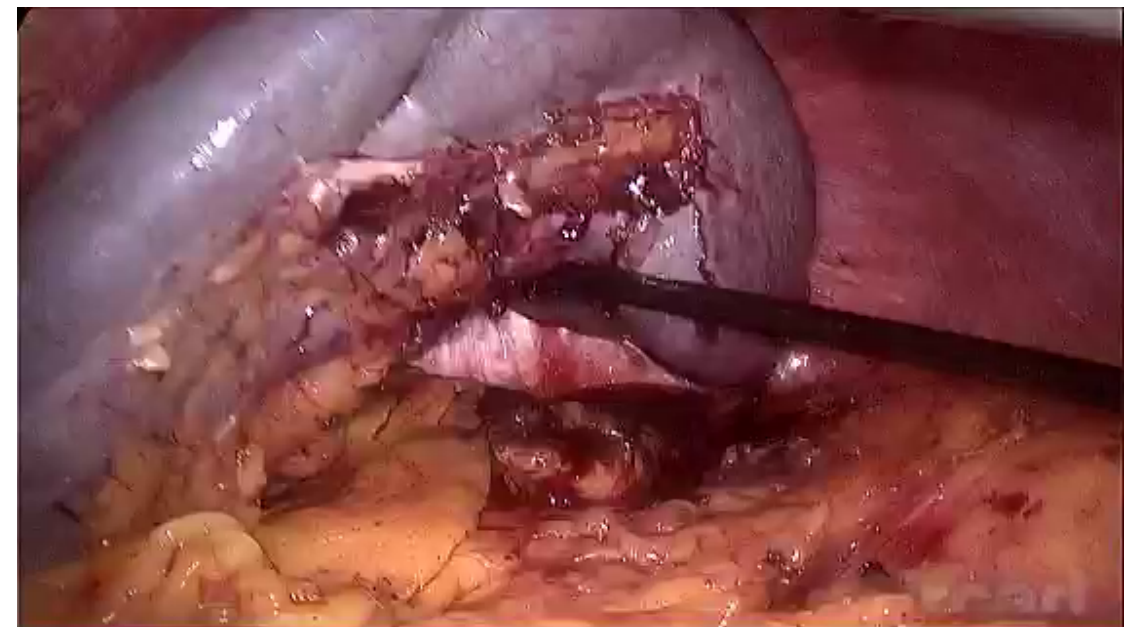
Option 5 Mobilization of greater curvature of the stomach using ultrasonic scissors (AutoSonix™ ultrasonic surgical system)

6. Posterior freeing



Division of lienorenal ligament and full mobilization of the spleen

7. Extraction



Extraction through morcellation

Conclusion

The laparoscopic approach to the spleen has become a gold standard nowadays. Thrombopenia is not a contraindication and makes it possible to perform splenectomy with very low rates of platelets, without the need for any preoperative transfusion.



3.1. Intrahepatic lithiasis &
Hepatectomy

3.2. Morbid obesity:
The EndoBarrier™ device

3

Clinical Cases

Clinical cases, continuing medical education

3.1. Robotic lateral sectionectomy with biliary tract stones extraction



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IRCAD-EITS, IHU Mixsurg



Jacques Marescaux, MD, FACS,

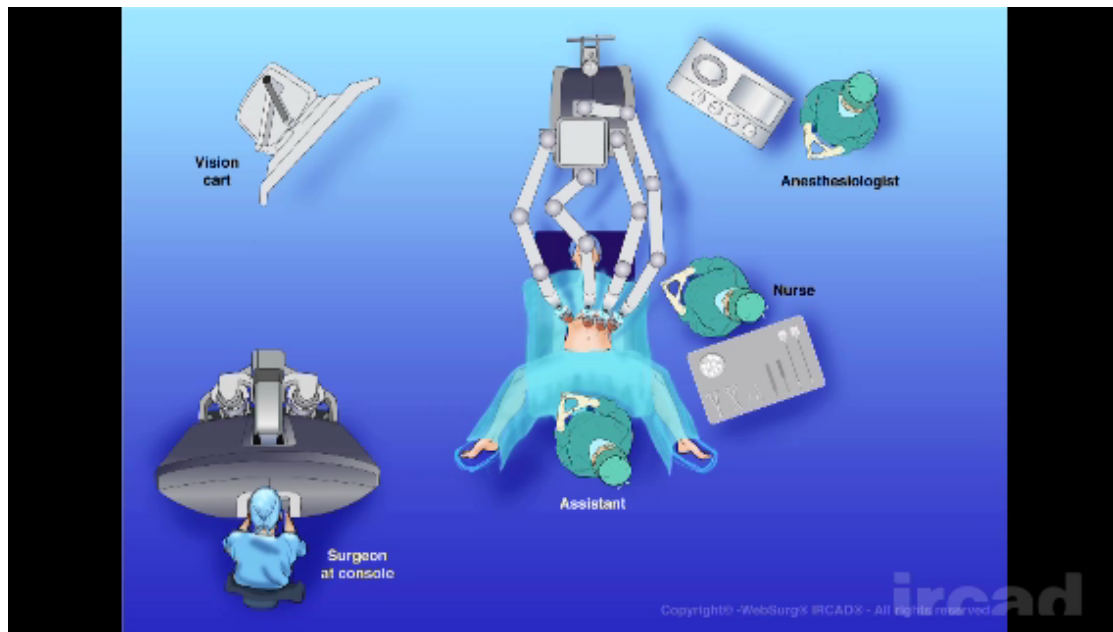
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Intrahepatic lithiasis can be associated with biliary tract abnormalities (such as bile duct dilatation) corresponding to bile duct cyst type V (Caroli's disease). Therapeutic objectives aim to manage frequently concurrent cholangitis, to remove all existing stones and avoid the onset of the disease, to cure any potential biliary abnormality responsible for dilatation, biliary stasis and infection, to create an adequate biliary drainage and to prevent any recurrence.



Sagittal view of cholangio-MRI

3.1. Robotic lateral sectionectomy with biliary tract stones extraction



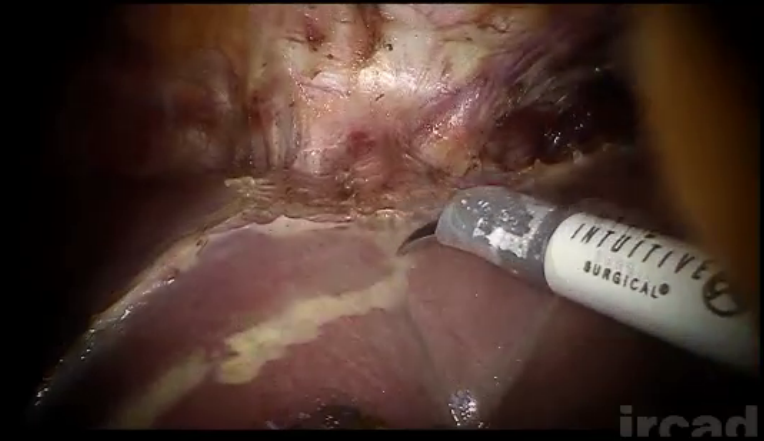
Installation and trocars landmarks

The following surgical steps can be followed:

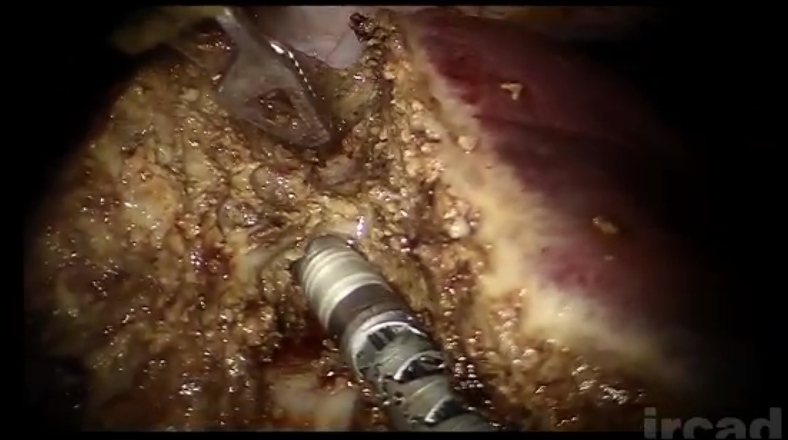
- stone extraction by means of a choledochotomy and instrumental maneuvers under endoscopic control;
- hepatectomy if stones are located within a liver segment;
- hepatic transplant in case of an associated secondary biliary cirrhosis.

Or in case of stones disseminated in the entire biliary tract and associated with multiple stenoses (e.g., sclerosing cholangitis, vascular problem, biliary rejection after transplant).

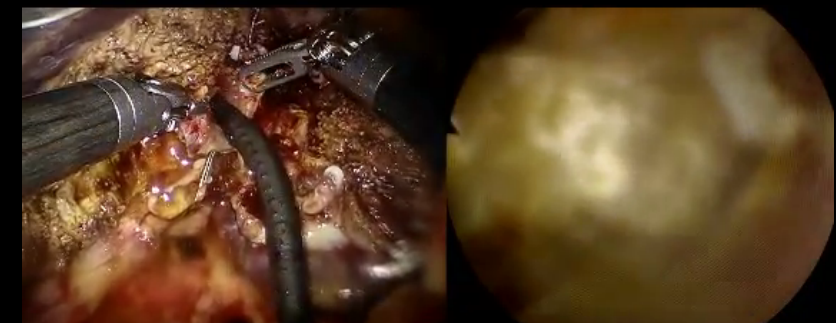
In the present case, left biliary tract involvement has led us to decide on liver resection.



Hepatic pedicle control and liver mobilization



Transparenchymal transection



Biliary tract disobstruction

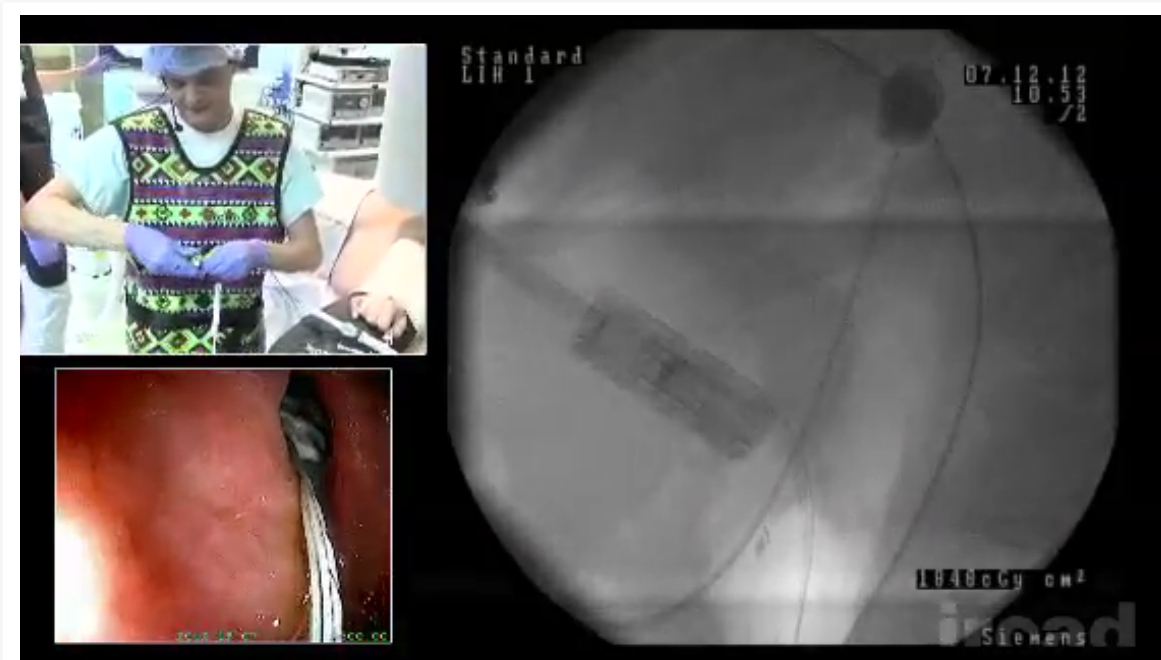
3.2. New frontiers in the treatment of the metabolic syndrome: focus on the EndoBarrier™ device




Manoel Galvao Neto, MD
Gastro Obeso Center,
Sao Paulo,
Brazil

For a long time, morbid obesity has been known as a risk factor for cardiovascular conditions, type 2 diabetes mellitus (T2DM), and metabolic syndrome, which is one of the main causes of death in developed countries.

Besides advances in the clinical control of the metabolic syndrome (dyslipidemia, hypertension, and T2DM), there is still room for improvement. Recently, bariatric surgery has been used to treat such conditions, especially in obese patients, hence creating metabolic surgery. Also bariatric surgery is under investigation to treat metabolic conditions in lower BMI patients, especially in those with T2DM, since medical treatment often results in weight gain. Scientific evidence has been generated in order to allow surgery to control metabolic co-morbidities [1] . One of the metabolic surgery options is duodenojejunal exclusion that had yielded experimental [2] and clinical data [3] .



EndoBarrier™

The duodenojejunal bypass liner (DJBL, EndoBarrier™, GI Dynamics Inc., Lexington, MA, USA) is an endoscopic implantable device that mimics the intestinal bypass component of the duodenojejunal and Roux-and-Y gastric bypass, and has been studied clinically in obesity and T2DM as well as in animal models since 2005 [4] .

The EndoBarrier™ device is a temporary endoscopic implantable device. It is made up of a Nitinol anchoring with barbs for fixation and an impermeable plastic conduit, 62cm long. The implantation is performed under general anesthesia and the device is introduced over a guidewire. The plastic conduit is stretched into the duodenum and the proximal jejunum under radiological surveillance. After sleeve positioning, the anchoring system is opened into the duodenal bulb. Explantation (namely retrieval) combines fluoroscopy and endoscopy and is accomplished by





Manoel Galvao Neto interviewed by Silvana Perretta



Manoel Galvao Neto interviewed by Silvana Perretta

collapsing the anchor with a custom-made grasper and then pulled inside a hood. The hood protects the tissue from the barbs during withdrawal, and fluoroscopy is also used to assure safety. The device seems to have a good safety profile and is now clinically available in South America and Europe to be used up to a total of 12 months.

An experimental study has generated data proving that the endolumenal sleeve can control glycemia on diabetic rats when compared to a sham group [5]  In humans, a prospective randomized sham-controlled study (12 X 6 patients) in morbidly obese T2DM subjects carried out in Chile [6]  has demonstrated a significant improvement in glycemic control in the EndoBarrier™ group (19.1% improvement) against sham (10% worsening) in the very first week. In Brazil, a single-arm prospective

6-month study with 77 morbidly obese T2DM patients [7] could significantly reduce HbA1c in all patients ($p < 0.001$); the TG/HDL ratio of 5.75 presented a significant reduction of 4.36 at 6 months ($p < 0.001$). A subset of 22 patients observed up to 1 year shows a drop of 2.3 ± 0.3 in HbA1c. Also in Brazil, another single-arm prospective study (in press) in patients with a BMI < 36 with a 1-year duration has demonstrated a significant improvement in T2DM as well as metabolic conditions. These results were obtained thanks to an evolving technology and despite the transient nature of the treatment they are very promising and present an innovative and less invasive alternative to the treatment of the metabolic syndrome.

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4.1.Visible patient service VR-
RENDER® demo



New Technology

Recent breakthroughs in cutting-edge minimally invasive strategies



4.1. Visible patient service VR-RENDER® demo



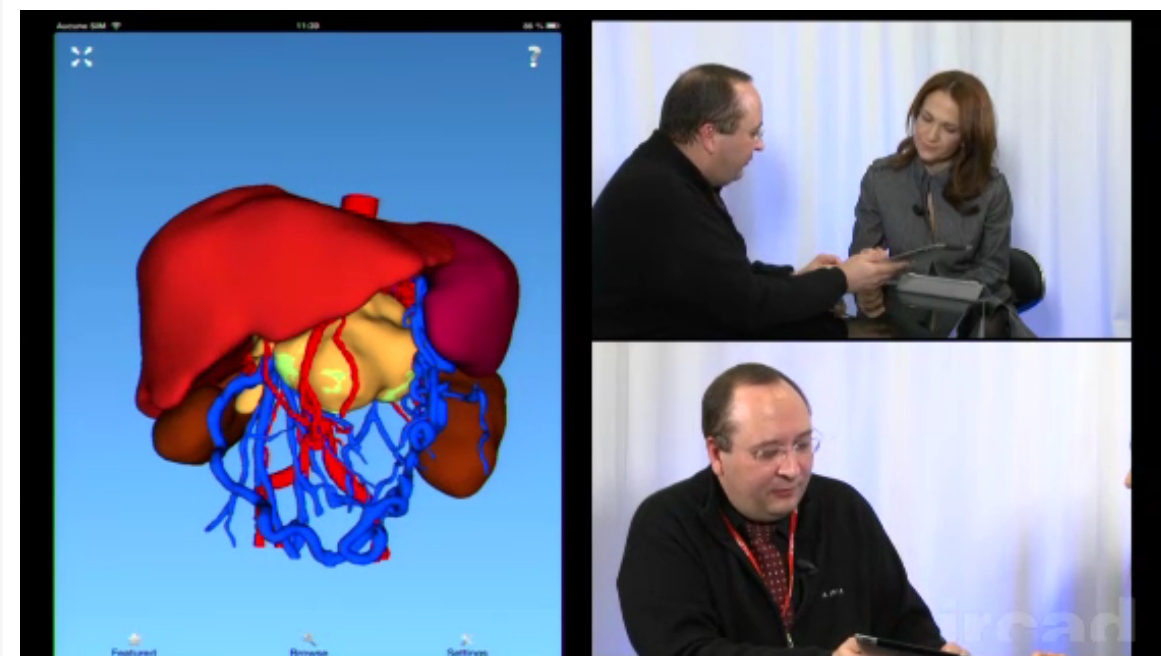
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Luc Soler interviewed by Silvana Perretta


Within the framework of the European FP7 PASSPORT project [↗](#) and in the spirit of its charge-free WeBSurg virtual university dedicated to surgeons, the IRCAD (Research Institute against Digestive Cancer) has developed a new online service which aims to develop a 3D model of patients using their 3D medical imaging. This service has been tested with a limited number of partner hospitals during the PASSPORT project and demonstrated its efficiency.

The IRCAD now aims to extend this service by creating the “Visible Patient” online project. To access it, a surgeon must first send the DICOM medical image of his/her anonymous patient via an easy-to-use web page.

The “Visible Patient” service receives the request and extracts the patient-specific 3D modeling of visible anatomical and pathological structures from medical images. This virtual patient, a kind of

digital clone of the patient, is put back onto the web server. The surgeon automatically receives an email notification and can download the 3D patient reconstruction through the same web page.

The 3D model can be visualized on various devices such as personal computers using VR-RENDER® ircad 2010 (Windows or MacOS) or mobile devices using Visible Patient for iOS and Android. These software tools are free of charge and are already available on WeBSurg and the Apple or Google store. To test it, more than 30 anonymous clinical cases can be downloaded for free.

As already shown on WeBSurg , preoperative simulation as well as its intraoperative use provide a much more precise follow-up of tumor evolution, improve surgical planning, and reduce intraoperative risks. Additionally, it is a mandatory element of augmented reality, the next step of Visible Patient.





5.1.Christmas Market

5

Cultural escapes

Alsace is a region of many talents.
Seep into our culture, history and traditions

5.1. Christmas Market



Christmas market from November 24 to December 31, 2012

Strasbourg, the Christmas Capital

More than 2 million visitors each year, some 300 chalets, and thousands of lights bring a magical touch to the squares and alleyways. In every way, Strasbourg deserves the title of “capital of Christmas”, revisiting a long tale connecting history and legend.

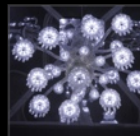
Christmas markets in France otherwise known as “marchés de Noël”, provide a great opportunity for a winter weekend break.

In Alsace, Christmas traditions are strong and alive. Many picturesque villages and towns set up Christmas markets, where local artisans display their wares, from ornaments to gingerbread and cookies.

Since 1570, Strasbourg has opened its Christmas market around the city's prestigious Cathedral. At that time, the fair was called the Klausenmärik or ‘Saint Nicholas Market’.

As fairs and markets were numerous in that era in the large towns of the Holy Roman Empire, this festive celebration especially aimed to distribute presents to children to celebrate Saint Nicholas.

Let yourselves be mesmerized by the intimate and warm-hearted atmosphere of Strasbourg’s art and historical town offering an ideal backdrop to such merry events. Every way your eyes turn, you will enjoy the sight of decorated shop windows and half-timbered houses, in a row of animated streets and alleys where spicy scents of orange and cinnamon fill the air.



5.1. Christmas Market

Among hundreds of wooden stalls, there is something to suit all tastes: candy, perfume, Christmas decorations, jewelry, and typically regional products such as refined wines and foie gras.

At nightfall, a subtle play of lights enhances the numerous architectural gems ranging from the Middle Ages up until the 19th century. A stupendous 'path of light' draws passers-by to discover the 12 Christmas markets, each of them nestled in an idyllic and peculiar setting. Nine Baccarat chandeliers can be found on Rue des Hallebardes. They turn the street into a luxurious home, compelling passers-by to stroll and look up.

Of all Alsace foodstuffs, bredele are probably the most popular that you will see at Christmas markets.

You will be entertained to mulled wine, different sorts of cheese, sausages, and most definitely...

Alsatian Christmas cookies or Wihnachts Bredele.

In Alsace, Christmas at home would always include bredele. So what, you might say, what's so special about Christmas cookies? Well, these are cookies with an irresistible touch of spices, hazelnuts, almonds and honey and they come in a whole range of shapes and sizes as stars, pine trees, crescents, checkerboards and swirls. There are without exaggeration at least a hundred possible variations of Christmas cookies in Alsace. And for the final touch, which makes them wickedly irresistible, a layer of jam, bits of chocolate or a layer of icing. As far as the different types of bredele are concerned, the more the merrier!





The Christmas tree tradition also finds its roots in Alsace. Throughout the Middle Ages, 'Games of Paradise', which are stories depicting the history of creation, took place in front of churches on Christmas Eve and the tree of paradise was in fact a fir tree covered with apples.

From 1521 onwards, a city edict was passed to "authorize forest guards to chop down small fir trees in view of the celebration of Christmas". The custom quickly spread across the whole of Alsace. Originally, fir trees were decorated with apples, sugar, multicolored roses, and later with bredele.

Legend has it that around 1850, when apples were scarce due to drought, the glassworkers of Meisenthal fashioned apples out of blown glass, and that Christmas baubles were born thanks to the shortage of apples. The war of 1870 brought about the emigration of many Alsations. As a result, the custom of celebrating Christmas gradually took over all regions of France, with the fir tree subsequently conquering Germany, Switzerland, Austria, the Czech and Slovak Republics, Scandinavian countries, England as well as the United States.

The next Christmas Market will take place from November 30 to December 31, 2013. We very much look forward to your visit!

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European Institute Of TeleSurgery (IRCAD France)

Located within the compounds of Strasbourg's University Hospital, the EITS (European Institute of TeleSurgery) has become internationally renowned over the past 18 years and makes full benefit of the IRCAD's 8000 square meters.

www.ircad.fr



Asia Institute Of TeleSurgery (IRCAD Taiwan)

The AITS, was inaugurated in May 2008, and is equipped with a 7300 square meter structure. It is one of the largest training centers in minimally invasive surgery and is ideally located in Asia. It provides 23 operating tables suitable for training on live tissue.

www.aits.tw

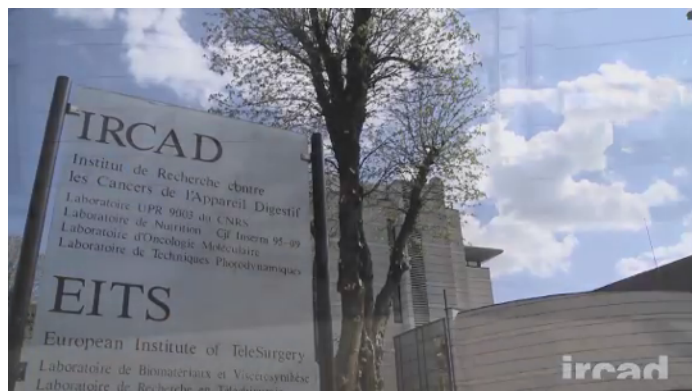


American Institute Of TeleSurgery (IRCAD América Latina)

IRCAD América Latina was inaugurated in July 2011

With a surface of more than 7,000 square meter, IRCAD América Latina is one of the largest training centers in minimally invasive surgery in America.

www.amits.com.br



The current general conditions of use and navigation (the "Conditions") apply exclusively between the IRCAD, 1 place de l'Hôpital, Hôpitaux Universitaires de STRASBOURG, 67000 STRASBOURG, an association registered in the Strasbourg District Court (Tribunal d'Instance), volume LXIV, No. 119, April 13, 1992 (the "Institute"), and the viewer of any material produced by the World Journal of Minimally Invasive Surgery (e-WJMIS) regarding the conditions of use, medias produced, and navigation on these.

The Conditions shall systematically be brought to the knowledge of each user of the e-WJMIS to allow them to use the e-WJMIS, with any other conditions being excluded.

Accordingly, by using the e-WJMIS the user agrees to be fully and unconditionally bound by the Conditions.

Any contrary condition stipulated by the user, unless it is expressly accepted, shall not be binding on the Institute regardless of when it is brought to the knowledge of the latter. Any condition not complying with the Conditions will be discarded unless the Society has recognized their applicability expressly and in writing. Any failure by the Institute to follow any one of the Conditions, at any given time, shall not be construed thereafter as a waiver of any one of the said Conditions.

The Institute reserves the right to modify the Conditions at any time, provided that these modifications are mentioned on the e-WJMIS.

e-WJMIS content - warning

The objective of the e-WJMIS is to allow the consultation of medical and surgical information in all surgical specialties by surgeons, doctors, nurses, the medical profession, patients and the general public.

The e-WJMIS features considerable amount of information on surgical practices through operative

technique chapters, new devices, clinical cases, and case reports.

The information contained in the e-WJMIS has been provided by surgeons independent of the Institute, and validated by an editorial and scientific committee independent of the Institute. The members of the committee are listed on the e-WJMIS.

We shall use our best endeavours to ensure the accuracy and updating of any information published on the e-WJMIS, of which we reserve the right to correct the content at any time and without notice. However, we cannot guarantee the accuracy, precision or exhaustiveness of any information made available on the e-WJMIS. Accordingly, we refuse to accept responsibility or liability:

for any inaccuracy or omission in the information published on the e-WJMIS;

for any damage resulting from fraudulent intrusion by a third party with the effect of changing the information published on the e-WJMIS;

and more generally any direct or indirect damage, regardless of its cause, origins, nature or consequences, caused by any person accessing the e-WJMIS or being unable to do so, by any use of the e-WJMIS and/or by any credit attributed to information derived there from directly or indirectly.

The Institute and the e-WJMIS adhere to the ethical principles applying to medical information and healthcare services.

The information and services provided on the e-WJMIS do not constitute a medical consultation, neither directly nor indirectly. In no event may the proposed information and services be considered as replacement for a consultation, an examination or a diagnosis by a doctor, and they may not be construed as a means of promoting surgical techniques.

Users shall not use the information on the e-WJMIS in order to formulate a diagnosis or to determine a course of treatment, including the taking and/or discontinuance of medication, without first consulting a doctor.

Only a practising surgeon with State diploma or whose diploma is recognized by a State is entitled to evaluate our information and to assess, if necessary, how to practically and under his/her sole responsibility apply the surgical and medical advice published on the e-WJMIS.

The user acknowledges that the information made available thereto is neither comprehensive nor exhaustive, that it is offered in relation to specific cases that cannot be applied generally and that the said information does not cover the entire range of symptoms, medicinal products and courses of treatment pertaining to the various complaints concerned.

Compliance with laws and regulations

The e-WJMIS is produced in Strasbourg, France and complies with French law. In the event of any dispute, the competent courts of the city of Strasbourg (France) alone shall have jurisdiction.

When you use the e-WJMIS you are required to comply with any legal provisions and regulations in force and especially:

a) Applicable copyright and intellectual property regulations in multimedia creations, software, texts, articles, photos, registered trademarks, databases, and images of all kinds.

The name and trademark "WJMIS" have been registered under French law and are protected internationally©. If you wish to use our trade name "WJMIS", you should first obtain our prior written authorisation.

Any linking to the e-WJMIS requires our prior authorisation. The Institute, and in certain cases its partners, are the holders of the entire collection of intellectual or industrial property rights pertaining to the content of the e-WJMIS.

In particular, the illustrations are originals and the videos have been recorded specifically for use on the e-WJMIS. The rights to texts written by authors have also been ceded to the Institute. If you use any information on the e-WJMIS, you are required to obtain our prior written authorisation before any distribution thereof.

For such purpose, you are reminded that any indications pertaining to the existence of rights may not be deleted and that any total or partial reproduction without authorisation constitutes infringement.

In addition, you are prohibited from any substantial qualitative or quantitative extraction of the e-WJMIS databases, or from using the databases in an abnormal context.

b) Regulations on the automated processing of personal data

Any photographs and videos showing individuals shall only be used for the purposes of illustration.

In any video commentaries and documents published on the e-WJMIS, no information will be given that allows the identification of patients.

The Institute undertakes not to disclose any information that it may receive from you to third parties. It shall remain confidential and shall only be used by our internal services for the processing of your order, as well as to enhance and customise communication and the cultural and product offer reserved for customers of the Institute.

c) Public policy regulations, such as those pertaining to any pornographic, racist or unlawful content that may be harmful to another user or may undermine the brand image of the Institute, by means of provocative messages, texts or images

d) Regulations pertaining to the privacy of individuals
On such basis you undertake not to send, via the interactive services offered to you, any messages of an

insulting, offensive, denigrating or degrading nature or messages that are unrelated to the issues raised.

e) Regulations pertaining to the rights of the press
On such basis you shall refrain from any defamation or insults against e-WJMIS users or third parties.

f) Regulations pertaining to fraud
On such basis you shall refrain from any hacking of an automated data processing system or from any partial or total alteration of the elements therein. You are hereby informed that anyone committing such acts may be prosecuted.

More specifically, in the context of the interactive services, the Institute reserves the right to delete content of any kind whatsoever, immediately and without prior notice, and especially any message, photograph or graphics that may violate applicable laws and regulations and especially those regulations mentioned hereinabove.

g) Regulations pertaining to the use of images
Regulations pertaining to the use of images of people are respected by the e-WJMIS. Any use of images of people on the e-WJMIS implies the previous consent of the e-WJMIS.

Interactive services on the e-WJMIS

The entire collection of provisions in the Conditions shall apply to your participation in the interactive services proposed on the e-WJMIS.

You shall accordingly comply with any applicable laws and regulations, especially those described hereinabove.

On such basis, you shall be solely liable for any information, messages or images, and in general for any content that you may send via the interactive services such as chat or forums in particular.

You hereby agree that the Institute may take the initiative, without prior notice, to partially or totally delete any content that you may send or that may be sent to you via the interactive services, should such content be likely to violate any applicable regulations or be contrary to moral standards.

You acknowledge that you shall be solely liable for any use that may be made of the content that you have sent, of any nature whatsoever, and that the Institute shall not monitor or warrant the accuracy, legality, quality or reliability of the content, of any nature whatsoever, that is distributed via the interactive services on the e-WJMIS.

You shall be solely liable for any contacts established via the interactive services on the e-WJMIS.

Security

You acknowledge that, notwithstanding the resources implemented by the Institute, the e-WJMIS may present specific technical features that make it impossible for the Institute to guarantee the absolute continuity of access to the service or response times, as well as security in the transmission of data.

In any event, you hereby acknowledge that any information and services offered on the e-WJMIS:

- may be suspended due to cases of force majeure, to events beyond the control of the Institute or to circumstances for which it is not responsible or liable,
- may contain errors of technical or human origin,
- may result in occasional losses of data.

Consequently, the Institute should not be held liable, particularly in case of:

- temporary interruptions for the updating of certain files,

- difficulties in functioning or temporary interruptions of these services outside of our control, particularly in case of interrupted electricity or telecommunication services,

- temporary interruptions of the services required for their evolution or maintenance,

Disclaimers

The e-WJMIS complies with any applicable legislation in France. The Institute shall not be rendered liable for any failure to comply with the legislation of the country in which the e-WJMIS is delivered and/or used. You shall be responsible for verifying with any local authorities about the possibilities of importing or using any items or services that you may consider ordering.

Any photographs and texts reproduced and illustrating the e-WJMIS are not contractually binding. Accordingly, the e-WJMIS shall not be liable in the event of errors in any of the said photographs or texts, or in case of error in the presentation of Products published on the e-WJMIS.

When the Institute does not fulfil one or several of its duties, its liability will be limited to the total sum received from the user.

The Institute shall not be liable for any failure to perform a confirmed agreement due to stock shortage, the unavailability of Products, force majeure, disturbances or partial or total strikes especially in postal services and means of transport and/or communication, as well as flooding or fire.

The Institute shall not be rendered liable for any indirect damage, any loss of business, loss of exploitation, damages, punitive damages, liquidative damages, moral prejudice, legal proceedings, any commercial nuisance, loss of brand image, loss of earnings.

Generally speaking, the Institute shall not warrant the comprehensiveness, exhaustiveness or accuracy of the content of any information and services proposed on the e-WJMIS, but the Institute shall use its best endeavours to offer users good-quality content.

The Institute shall not be liable for any undesirable effects that may result from the application of the proposed operating techniques.

Furthermore, the Institute does not in any event guarantee any particular result following the implementation of any information and services proposed on the e-WJMIS.

The Institute may not be rendered liable for any use of the e-WJMIS that is contrary to the principles of integrity and ethics.

In any event, the user acknowledges that the Institute or any one of its partners or servants may not be rendered liable on the basis of any use that the user may make of the information and services proposed on the e-WJMIS and agrees that such information and services shall be used under the user's sole and entire liability, supervision and management.

General provisions

The e-WJMIS is produced in Strasbourg, France and complies with French law. The language of this agreement is English. The Conditions as well as every sale and service provision performed by the Institute shall be governed by the laws of France, with respect both to procedural and substantive rules.

The Institute reserves the right to amend any provisions of the Conditions as well as the specific conditions that appear on the order forms. Your continued use of the e-WJMIS following the posting of changes to the Conditions means that you accept those changes.

The Conditions shall express the entire collection of undertakings by the parties, and no general or specific

conditions in any other documents may be considered as falling within the scope of the rights and obligations existing between the Institute and users.

Should one or more of the clauses of the Conditions be declared invalid, on any grounds whatsoever, the other clauses shall remain in full force and effect.

In the event of any conflict of interpretation between any heading and the clause to which it refers, the disputed title in question shall be declared unwritten.

If you have any questions or complaints regarding this Terms of Use Statement, please email us and we will endeavor to respond to you promptly.