

The flexible endoscope was developed over 50 years ago as a diagnostic tool for the gastrointestinal (GI) tract. Since then, many therapeutic interventions were developed using the endoscope, mostly by surgeons. In the past decade, following technological developments and improvements made in light sources and video, more advanced procedures were developed, and the flexible endoscope is slowly becoming a powerful surgical tool that enables performing advanced procedures that replace traditional surgery, such as intra-operative endoscopy for exact localization of pathologies, active guidance of the surgical acts during surgery, treatment of common diseases of the GI tract and interventions to treat post-operative complications. The use of the flexible endoscope by surgeons varies between regions. Whereas it is a mandatory part of surgical residency in North America, Australia and parts of Asia, in other parts of the world, including Israel, flexible endoscopy is not accessible to surgeons. In this review we chart the reasons for this phenomenon and define the needs for change so that flexible endoscopy will become a common surgical tool in Israel. ●

### ACUTE DIVERTICULAR DISEASE – IS IT STILL A “SURGICAL” CONDITION?

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The therapeutic approach to diverticular disease has changed significantly in recent decades. From a disease treated almost exclusively by surgery, diverticulitis is nowadays treated operatively in specific indications, shifting the majority of patients towards an outpatient based treatment. Significant changes occurred not only in uncomplicated diverticular disease but also in complicated cases, treated in the past with emergency surgery. These changes have been studied relentlessly around the world, and despite the fact that the vast majority of patients presenting with acute diverticular disease are not treated with surgery, it is still considered a surgical condition. In this review article, we set out to examine whether there is still justification to consider acute diverticulitis as a surgical disease and in addition, to examine whether the changes in treatment seen around the world are compatible with the current treatment strategies implemented in Israel. ●

### RESIDENCY IN GENERAL SURGERY – PAST, PRESENT AND FUTURE: REVIEW OF THE CURRENT STATUS AND PRESENTATION OF THE ISRAELI GENERAL SURGERY RESIDENTS ASSOCIATION (ISRA)

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Over the last decade the General Surgery Residency Program in Israel has changed tremendously. Residency settings have changed significantly – Residents time and exposure to the surgical ward and especially the time spent in the operating theater have dropped dramatically. This situation has evolved, while concurrently, their range of responsibilities expanded. The Israeli General Surgery Residents Association (ISRA) was founded in 2017 by residents as part of the Israeli Surgical Association in order to maintain and improve surgical training and allow equal access to all residents. The elected member of the ISRA serves as a delegate on the Israeli Surgical Association Board of Directors. The current review outlines the history of general surgery residency, describes surgical residency programs from around the world with special attention to measures to improve training amid medical workforce changes. In addition, The Israeli General Surgery Residents Association (ISRA) and its work will be presented as an example for residents taking an active and influential part in establishing new horizons in surgical training. ●

### CYTOREDUCTIVE SURGERY AND HYPERTHERMIC INTRAPERITONEAL CHEMOTHERAPY (HIPEC) FOR PERITONEAL METASTASIS OF GASTRO-INTESTINAL ORIGIN

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The management of peritoneal surface malignancies has changed dramatically. Moving, in less than two decades, from a nihilistic approach offering limited palliation and a short median survival into an aggressive surgical approach combining resection of all tumor deposits (cytoreductive surgery (CRS) combined with hyperthermic intra-peritoneal chemotherapy (HIPEC). This novel approach dramatically changed the outcome of this group of disorders offering a long term survival with curative intent to selected patients. The aim of the current review is to describe, based on current medical literature and our experience, current treatment options with CRS+HIPEC in various peritoneal surface malignancies of gastrointestinal origin, namely, colorectal cancer and appendiceal cancer, indications, technique, and outcomes. ●

**Background:** Mammographic breast density has been associated with higher risk of breast cancer and decrease in its sensitivity, while hormonal replacement therapy (HRT) in turn, has been implicated in increasing mammographic density and is considered a risk factor for breast cancer by itself. The inter-relationship between HRT, breast density and any mammographic or sonographic finding requiring further investigation has not been fully investigated.

**Aim:** The purpose of this study was to portray and analyze the inter-relationship between the use of HRT, mammographic breast density and the finding of any mammographic abnormality that prompted further investigation such as core needle biopsy or additional imaging testing, while controlling for obstetric and relevant demographic data.

**Methods:** A total of 2,758 consecutive, screening mammograms performed during one year in a single academic medical center in Israel were analyzed. Each mammogram was supplemented by high resolution ultrasound. Density was measured by a visual, semi-quantitative, 5-grade scale, based on Boyd's classification and grouped into low density mammograms (LDM) (1-3) and high density mammograms (HDM) (4-5). Demographic and obstetric data, personal and family history of breast cancer, and the use of HRT were entered into the database. These parameters were correlated with breast density and any detected abnormality that prompted further investigation. Univariate and multivariate analyses as well as multivariate logistic regression were performed using SAS 9.2.

**Results:** A significant difference in density was observed between pre- and post-menopausal women ( $p = 0.0001$ ). However, the use of HRT in post-menopausal women was not associated with higher incidence of HDM (18.6%,  $n=110/592$ ) compared to post-menopausal women without HRT (15.4%,  $n=211/1370$ ) ( $p=n.s.$ ). Mammographic abnormality was more likely to occur in post-menopausal women without HRT (52%,  $n=711/1370$ ) compared with women on HRT (38.7%  $n=229/592$ ) ( $p = 0.0001$ ). This held true for solid lump ( $p=0.0001$ ), tissue irregularity ( $p=0.016$ ) and calcifications ( $p=0.0005$ ). Menopause was associated with higher likelihood (48%) of any mammographic finding compared with 41.6% in pre-menopausal women ( $p = 0.0017$ ). A total of 266 women with mammographic findings prompting histological assessment were identified, revealing 105 malignant lesions. HRT in post-menopausal women was associated with lower incidence (28%) of malignancy compared to post-menopausal women without HRT (50%).

**Conclusions:** The present study, portraying the inter-relationship between mammographic breast density, any abnormal finding in screening mammograms, and the use of HRT has not found such treatment to be associated neither with increased density, nor with higher probability of finding malignancy. Furthermore, a lower incidence of mammographic abnormality was noted in HRT users. Albeit, further and larger studies are required to substantiate these findings. The results

of this study do not support the notion that HRT increases the likelihood of malignancy or affects breast density. ●

## INTRAOPERATIVE RADIOTHERAPY (IORT) IN EARLY BREAST CANCER - 500 PATIENTS, ONE CENTER'S EXPERIENCE

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**Background:** Breast-conserving therapy is the standard treatment for early-stage breast cancer. The treatment includes tumor resection and a whole breast irradiation. Intraoperative radiotherapy is a single dose of irradiation given to the tumor bed immediately after it is removed. This treatment is suitable for a selected population of patients with early stage breast cancer, which constitutes about 20% of all breast cancer patients and is supposed to replace the standard whole breast radiation treatment.

**Purpose:** To present our Institute's experience with intra-operative radiotherapy in this selected population by collecting and analyzing clinical data, including long-term follow-up.

**Methods:** Between the years 2006-2017, 737 women with early breast cancer were treated in Carmel Medical Center with intraoperative radiotherapy. We herein report the results of the first 500 patients who were treated until 2015.

**Results:** In 13.8% of the patients, additional breast treatment was recommended due to poor pathological characteristics of the disease in final pathological examination. During a median follow-up period of 74 months (1-136), recurrence was observed in 22 patients (4.4%), and in 7 patients (1.4%) recurrence was observed in regional lymph nodes; 13 patients (2.6%) developed metastatic disease. Risk factors for regional recurrence were identified: tumor size greater than 2 cm, lack of adjuvant therapy and poor genetic profile of the disease.

**Conclusion:** Intraoperative radiotherapy is feasible and may offer an alternative to the standard whole breast radiotherapy, in low risk early breast cancer patients. The patients should be selected according to known risk factors. ●

## FLEXIBLE ENDOSCOPY IN THE HANDS OF THE SURGEON - THE ISRAELI SURGEON'S POINT OF VIEW

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## CYTOREDUCTIVE SURGERY AND HYPERThERMIC INTRAPERITONEAL CHEMOTHERAPY FOR PERITONEAL CARCINOMATOSIS OF COLORECTAL ORIGIN – FIRST 100 CASES

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**Background:** Cytoreductive surgery with hyperthermic intraperitoneal chemotherapy (CRS/HIPEC) is an effective treatment for selected patients with peritoneal carcinomatosis of colorectal origin. We present our experience with the first 100 consecutive cases of this combined treatment.

**Methods:** CRS/HIPEC procedures were performed between 4/2009-8/2016. HIPEC was initially delivered using the "Open" abdomen technique; beginning in January 2014, HIPEC was delivered using the "Closed" technique. As a chemotherapeutic agent we used Mitomycin-C, perfused for duration of 90 minutes at 41 degrees Celsius.

**Results:** A total of 100 procedures were performed in 94 patients (64% females, median age 62 (22-83) years) with colon (n=89) or rectal (n=5) cancer. Complete cytoreduction (CC score $\leq$ 1) was achieved in 91 procedures. The average duration of surgery was 7.5 $\pm$ 2.3 hours, the median number of organs resected was 2 (0-6) and the median length of hospital stay was 9 (5-101) days. Postoperative complications occurred in 54% of procedures and the incidence of major complications (Clavien-Dindo 3-4) was 12%. Three patients (3%) died within 90 days postoperatively. Higher peritoneal cancer index (PCI) score, higher number of organs resected/anastomoses created and longer duration of surgery were associated with perioperative morbidity (all p $\leq$ 0.05). The median follow-up period was 2.1 years during which 50 patients died. The median overall survival (OS) and disease free survival were 3.1 years and 10.7 months, respectively; 7 patients survived  $\geq$ 5 years after surgery. Higher PCI score and occurrence of major postoperative complications were associated with poorer OS.

**Conclusion:** CRS/HIPEC for peritoneal carcinomatosis of colorectal cancer origin is feasible and safe. This treatment may benefit selected patients in terms of OS. ●

## INTRACHOLECYSTIC PAPILLARY- TUBULAR NEOPLASM: A NEW PATHOLOGY OF THE GALLBLADDER?

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The clinicopathologic characterization of tumoral intra-epithelial neoplasms of the gallbladder is fairly limited compared to that of similar tumors of the pancreatobiliary system. Until recently, pre-malignant lesions of the gallbladder were mostly reported as adenomas, which were microscopic and therefore regarded as benign and clinically inconsequential, whereas papillary lesions have been largely regarded as a papillary subtype of gallbladder invasive adenocarcinoma. In an attempt to create a unified terminology for these tumors, the term Intracholecystic papillary-tubular neoplasm (ICPN) was proposed to include all exophytic intra-epithelial tumors of the gallbladder measuring  $\geq$ 1 cm under one category. A few studies which have retrospectively analyzed tumors fulfilling this category found them to be remarkable analogous to the more well-characterized intra-epithelial tumors of the pancreatobiliary system such as IPMN of the pancreas and IPNB of the bile ducts and as such they also represent an 'adenoma-carcinoma' sequence in the gallbladder. Since then a number of case series have been published which attempted to characterize the clinical and pathological features of these tumors and their relationship with invasive carcinoma.

In this paper we report three cases of ICPN which represent different stages of the 'adenoma-carcinoma' sequence. ●

## PERFORATION OF LARGE BOWEL AS FIRST PRESENTATION OF BURKITT'S LYMPHOMA

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Perforation of large bowel as a first presentation of Burkitt's lymphoma is uncommon and the need for emergent laparotomy at first presentation is rare. We present a case of a young male patient who was admitted to the emergency room complaining of abdominal pain. After a proper workup he was diagnosed with a large bowel perforation. He underwent an emergent laparotomy. The pathological report was consistent with the diagnosis of Burkitt's lymphoma. ●

## THE EFFECTS OF HORMONAL REPLACEMENT THERAPY (HRT) ON MAMMOGRAPHIC BREAST DENSITY AND ABNORMAL MAMMOGRAMS PROMPTING FURTHER INVESTIGATION

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## GENERAL SURGERY IN ISRAEL - THE ISRAELI SURGICAL ASSOCIATION MODEL

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The Israeli Surgical Association (ISA) is celebrating its 60<sup>th</sup> anniversary. The current edition of the journal includes papers on surgical oncology, intraoperative radiotherapy and emergency surgery, as well as surgical education. The outstanding range of topics represents the academic achievements of Israeli general surgeons and highlights clinical and surgical research accomplishments. ISA is currently advancing changes in surgical education as well as promoting the use of flexible endoscopy among the relevant surgeons. These two topics are presented in articles in this current issue. A retrospective review of the past 60 years since the establishment of ISA celebrates its members' achievements with pride and gazes with excitement at the future as emergent technology will change future surgery and new horizons in surgical education will model the new professional and knowledgeable general surgeons. ●

## SARCOPENIA IS AN INDEPENDENT RISK FACTOR FOR DELAYED GASTRIC EMPTYING AFTER PANCREATICODUODENECTOMY

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**Background:** Sarcopenia is defined as the degenerative loss of skeletal muscle and can be measured using the cross-sectional diameter of the psoas muscle on computed tomography. Sarcopenia has been associated with a variety of post-operative complications. We propose that sarcopenia acts as an independent factor predictive of delayed gastric emptying (DGE) after elective pancreaticoduodenectomy (PD).

**Methods:** A retrospective analysis of a prospectively maintained database of all patients undergoing PD at our tertiary hepatobiliary center was performed for the period December 2014 - March 2017. For each patient, the preoperative cross-sectional diameter of the psoas muscle at the upper border of L4 was calculated. Measurements in the lowest third of gender specific groups were considered to be sarcopenic. The presence of DGE, post-operative pancreatic fistulas (POPF) and major postoperative complications graded as Clavien Dindo III or more were included in the analysis.

**Results:** A total of 40 patients were included, 15 (37.5%) of whom were classified as sarcopenic. Comparison between the

sarcopenic and non-sarcopenia groups revealed homogeneity in terms of gender, age, BMI and pre-operative albumin levels. DGE occurred in 11 patients (27.5%) of whom 7 were sarcopenic. Significantly more sarcopenic patients suffered from DGE (7/15 vs 4/25,  $p = 0.042$ ). Major postoperative complications and POPF occurred in 15 patients each (37.5%). Nevertheless, sarcopenia was not significantly associated with POPF or other complications. The presence of sarcopenia was found to have a significant relationship with the incidence of DGE (OR 4.594, 95% CI 1.052-20.057).

**Discussion:** Sarcopenia acted as an independent risk factor predicting DGE after PD but not for POPF or other major postoperative complications. ●

## PER-ORAL ENDOSCOPIC MYOTOMY - SUMMARY OF FIVE YEARS EXPERIENCE

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**Introduction:** Esophageal achalasia is a rare condition, characterised by progressive dysphagia due to innervation of the esophageal muscles and non-relaxation of the lower esophageal sphincter. The standard of care of surgical treatment is laparoscopic Heller myotomy. POEM-Peroral endoscopic myotomy is a new approach offering incisionless and selective myotomy.

**Aim:** This study aims to describe our experience and outcomes using this new surgical technique.

**Methods:** We performed a retrospective study using prospectively maintained data of all achalasia patients treated by POEM in our department. Data collected included patient demographics, gender, age, BMI, data related to the disease course in addition to data related to the surgery itself as well as both short and long term post-operative follow-up.

**Results:** Over the course of five years we performed 86 POEM operations, demonstrating a decrease in the Eckardt score from a mean of 8.87 to a mean of 0.7 in the immediate postoperative. Mean operative time was 86 minutes, with mean hospitalization time of 4 days. Intraoperative complications included 2 mucosal injuries while post-operative complications included 4 incomplete mucosal closures, 5 recurrent dysphagia and 5 patients with reflux requiring medical therapy.

**Conclusion:** In the last decade, POEM procedure is being performed worldwide and has been performed in our department for the past five years. Our results show a success rate of 94.2% with minor complications. In our institution, as in many institutions globally, POEM is the preferred method for treating achalasia. ●