# Abstracts
# Résumés

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**TWENTY-FIVE-YEAR EXPERIENCE WITH THYMOMA. B.P. Whooley, J.G. Antkowiak, H. Takita, T.M. Anderson, J.D. Urschel. Roswell Park Cancer Institute, State University of New York at Buffalo, Buffalo, NY, USA.**

**Introduction:** Thymoma is the most commonly encountered anterior mediastinal tumour. Diagnostic and therapeutic options have changed over the last 2 decades. Recent experience with these tumours is reviewed.
**Methods:** A retrospective review of thymomas treated between 1971 and 1996.
**Results:** Thirty-eight thymomas were treated over 25 years. The median age was 49 years. Twenty-two patients were symptomatic at presentation 4 of whom had myasthenia gravis. Median tumour size was 7 cm. Nine tumours were classified as noninvasive. Regional nodal spread was documented in 7 patients at presentation and distant metastasis in 1 patient. Complete resection was performed in 21 cases and subtotal resection in a further 4. Chemotherapy was used in 18 cases, primarily in the postoperative setting (10/18). Radiation therapy was a treatment modality in 27 patients, again primarily as an adjunct to surgery (17/27). Twelve patients had recurrent disease at a median interval of 12 months. At a median follow-up of 36 months, 18 patients had died of their disease. Median survival was 55 months, with a 5-year survival rate of 30%. Independent predictors of survival on multivariate analysis were metastases at presentation ($p = 0.02$) and disease recurrence ($p = 0.0001$).
**Conclusions:** Whereas thymomas often have an indolent course, death from advanced stage or recurrent disease is common. Therapy for this disease is best planned in a multidisciplinary setting. Currently, locally advanced thymomas and thymic carcinomas are treated with induction chemotherapy, surgical resection and postoperative radiotherapy.

**THE NUTRITIONAL STATUS OF HEAD AND NECK CANCER PATIENTS PRIOR TO TREATMENT. P. Warrick, M. Morningstar, J. Irish, D. Brown. Wharton Head and Neck Centre, The Toronto Hospital/Princess Margaret Hospital, Toronto, Ont.**

Protein-calorie malnutrition in patients with head and neck malignancy has long been recognized. This is attributed to limited oral intake due to tumour-related dysphagia, malignancy-induced cachexia, poorly controlled pain and, frequently, nutrient-poor pre-morbid diet.

After ethics board approval, a total of 40 patients (30 males and 10 females), previously untreated squamous cell head and neck cancer patients undergoing surgery or radiation treatment, gave written consent to enrol in this cross-sectional study to quantify their pre-treatment or baseline nutritional status. Subjective Global Assessment (SGA) scores and nutrition markers were acquired from all patients, with well nourished classified as a SGA-A and malnourished as SGA-B or C. Age and tumour site did not differ between the 2 groups; however, there was a larger number of lower-staged tumours in the well-nourished group ($p = 0.02$). Correlation of SGA with objective markers of nutritional status are shown in the table below.

| Laboratory investigations | SGA-A (well nourished), $n = 33$ | SGA-B/C (malnourished), $n = 7$ | $p$ value |
|---|---|---|---|
| Albumin, g/L | 45.8 ± 4.9 | 39.1 ± 4.5 | 0.002* |
| Transferrin, g/L | 2.59 ± 0.64 | 2.51 ± 0.77 | 0.77 |
| Hemoglobin, g/L | 139.2 ± 11.9 | 128.9 ± 21.9 | 0.08 |
| Lymphocytes, % | 23.5 ± 25.4 | 19.8 ± 19.7 | 0.72 |
| Ideal body weight, % | 117.3 ± 16.7 | 97.8 ± 15.0 | 0.0074* |

SGA is a well-known, easy to implement, previously validated nutrition assessment tool that finds frequent use among gastrointestinal surgery patients. However, our preliminary data suggest that SGA scores do not correlate well with objective markers of nutritional status. In its traditional application, SGA may lack sensitivity and specificity in the head and neck cancer population, especially when significant symptoms such as dysphagia, odynophagia, trismus, and taste and smell aversions were not included. An 18% prevalence of varying degrees of malnutrition in the study population was identified. Further study will involve nutrition-related surgical and radiotherapy risks using this assessment tool.

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**THE ROLE OF THYROID ULTRASOUND AND FINE-NEEDLE ASPIRATION BIOPSY ON THE DIAGNOSIS OF THYROID CANCER AND THYROID OPERATIONS PERFORMED IN SASKATCHEWAN (1970–1996). S.T.M. Kwauk, L. Ruo, R. Keith. University of Saskatchewan, Saskatoon, Sask.**

**Objective:** To determine the impact of thyroid ultrasound and fine-needle aspiration biopsy (FNAB) on the diagnosis of thyroid cancer and the number of thyroid operations performed in Saskatchewan.
**Design:** A retrospective evaluation.
**Setting:** The 6 major hospitals in Saskatchewan.
**Patients:** Patients with a diagnosis of thyroid cancer registered by Saskatoon and Regina cancer centres.
**Main outcome measures:** The incidence of thyroid cancer in Saskatchewan, the number of thyroid operations performed from 1970 to 1996, the number of thyroid ultrasounds performed between 1981 and 1995, and the number of FNABs performed on thyroid gland from 1970 to 1996 as recorded by the Medical Care Insurance Branch (MCIB) were examined.
**Results:** The number of thyroid ultrasounds has been increasing in all 6 hospitals since 1981, and FNAB has been performed with increasing frequency since 1978. The mean of the ratio of mortality to the incidence of thyroid cancer was 0.15 (SD 0.07) from 1979 to 1996. During the same period, the incidence of thyroid cancer did not increase. The number of thyroid operations performed with a benign final pathologic diagnosis only slightly decreased (15%) from 1994 to 1997.
**Conclusions:** Mortality from well-differentiated thyroid cancer was low in Saskatchewan from 1970 to 1996. An increase in the number of thyroid ultrasounds and FNABs in Saskatchewan has not resulted in an overall increase in the detection of thyroid cancer, which would be reflected by an increase in the incidence of thyroid cancer or a significant reduction in the total number of thyroid operations performed in the province.

**DRAINS PREDISPOSE TO ESOPHAGOGASTRIC ANASTOMOTIC LEAKAGE IN RATS. Y. Cui, J.D. Urschel, T. Loree, M. DeLacure. Roswell Park Cancer Institute and the State University of New York at Buffalo, Buffalo, NY, USA.**

**Background:** Surgeons commonly drain cervical esophagogastric anastomoses, but there is little objective evidence to support this practice. Studies in other areas of gastrointestinal surgery have shown that routine drainage is unnecessary and even detrimental to anastomotic healing. An animal experiment was conducted to see if a drain had a negative effect on esophagogastric anastomotic healing.
**Methods:** Esophagogastric anastomoses were done in 40 rats. In the experimental group (20 rats) a portion of latex rubber Penrose drain was placed over the anastomosis. This was not done in the control group (20 rats). Rats were sacrificed 7 days after surgery. The anastomoses were inspected for leaks, distracted in a tensiometer to measure breaking strength and subjected to hydroxyproline analysis (an indicator of wound collagen).
**Results:** There were 4 contained leaks in the experimental group (drain) and no leaks in the control rats ($p = 0.033$). Anastomotic breaking strength was $3.80 \pm 0.81$ N in the experimental rats and $3.46 \pm 0.64$ N in the control rats ($p = 0.18$, not significant). Anastomotic tissue hydroxyproline concentration was $615.9 \pm 52$ nmol/mg in the experimental rats and $609.4 \pm 195$ nmol/mg in the control rats ($p = 0.13$, not significant).
**Conclusion:** The presence of drain material predisposed to esophagogastric anastomotic leakage in this rat model.

**A MODEL OF CANCER IMMUNOTHERAPY VIA IMMUNOENCAPSULATION OF GENE-MODIFIED TUMOUR CELLS. S. Mandelbaum, Z.H. Li, C. Dodgson, M. Nutik, A. Schuh, S. Gallinger, A.K. Stewart. The Toronto Hospital and University of Toronto, Toronto, Ont.**

Generation of an effective anti-tumour immune response requires the host to overcome tolerance to tumour. Tumour recognition may be facilitated if tumour antigens are encountered in a context that facilitates antigen presentation in an appropriate cytokine milieu. Use of a novel, subcutaneously implantable microencapsulation device is proposed to deliver tumour antigen in conjunction with stimulatory cytokine. The device allows passage of macromolecules without allowing cell-to-cell contact and supports the growth of syngeneic or allogeneic tissues in vivo at high densities for extended periods of time. It is hypothesized that shed tumour antigen, fluxed across the device membrane, is incorporated, processed and presented by dendritic cells (DCs) to T lymphocytes, and that interleukin-12 (IL-12), delivered via genetically engineered tumour cells within the device, will enhance the immune response to tumour. IL-12 is a heterodimeric cytokine that promotes Th1 responses by promoting the differentiation of Th1 IFN-γ producing cells and serving as a costimulus for maximum IFN-γ secretion in response to specific antigen. Three tumour cell lines have been studied in this model: B9/BM1 myeloma (balb/c), MCA-38 colon carcinoma and MMB leukemia (C57BL/6). Retrovirally transduced variants secreting various cytokines included: B9/BM1 IL-12 (1 ng/$10^6$ cells/24 h), IL-12 plus CD80 (B7-1), granulocyte-monocyte colony stimulating factor (GM-CSF) and soluble Flt3 ligand (sFlt3L); MMB IL-12 and sFlt3L; and MCA-38 IL-12 (15 ng/$10^6$ cells/24 h), sFlt3L (300 ng/$10^6$ cells/24 h) and GM-CSF (15 ng/$10^6$ cells/24 h). Upon sectioning and staining, viable tumour cells have been seen in the devices in vivo up to 70 days for B9/BM1, 145 days for MCA-38 and 166 days for MMB which does best overall. IL-12 secreted from the device was detectable in vitro for up to 7 weeks and in vivo for 3 weeks in the B9/BM1 model. Tumour challenge experiments at 4 weeks after device implantation demonstrate no increase in survival in either the B9/BM1 or MCA-38 models between gene-modified cells and controls. MMB tumour challenge experiments demonstrated delay of tumour growth but not full protection and were less effective than gene-modified cells administered without the device. Cellular aspects are under examination via FACS analysis for lymphocyte subsets as well as by lymphocyte proliferation and cytotoxic lymphocyte assays.

**TRI-CISTRONIC VIRAL VECTORS CO-EXPRESSING INTERLEUKIN-12 (IL-12) AND CD80 (B7-1) FOR THE IMMUNOTHERAPY OF CANCER: STUDIES IN A MYELOMA MODEL. A.K. Stewart, S. Mandelbaum, M. Hitt, Z.H. Li, D. Cappe, A. Fong, F.L. Graham, T.S. Hawley, R.G. Hawley. The Toronto Hospital and University of Toronto, Toronto, Ont.**

Synergy between interleukin-12 (IL-12) and B7-1 (CD80) for cancer immunotherapy has been demonstrated in animal models of breast cancer, lymphoma and myeloma. With a view to clinical application, tri-cistronic retroviral and adenoviral type 5 (Ad5) vectors co-expressing IL-12 (IL-12p40 plus IL-12p35) and B7-1 (CD80) were constructed by utilizing 2 internal ribosome re-entry site (IRES) sequences to link the 3 cDNAs. A murine stem cell virus (MSCV)-based retroviral vector (MSCV.IL-12.B7-1) utilized distinct IRES sequences from the encephalomyocarditis virus (EMCV) and foot-and-mouth disease virus (FMDV), while Ad5 vectors contained transcriptional units with 2 EMCV IRES sequences under control of murine (Adm12.B7) or human (Adh12.B7) cytomegalovirus (CMV) promoters. A human myeloma line, U266, was transduced with MSCV.IL-12.B7-1 and a resulting clonal cell line, U12.B7, was generated, stably expressing both IL-12 (1 ng/24 h/$10^6$ cells) and B7-1 (CD80). Following Adm12.B7 infection, 95% of U266 cells expressed CD80 and secreted IL-12 at ~50 ng/24 h/$10^6$ cells. Adm12.B7 was consistently superior to Adh12.B7 with respect to both IL-12 and CD80. Both U12.B7 and adenovirally infected cells (UAd12.B7) stimulated enhanced allogeneic mixed lymphocyte proliferation and provoked increases in cytotoxic T lymphocyte (CTL) responses from normal donors against parental U266 cells. UAd12.B7 stimulated a greater proliferative and CTL response than the U12.B7 cell line, which was predicated mainly on CD80 expression. Neither natural killer (NK) nor interleukin-2 (IL-2) or IL-2/IL-12-generated lymphokine activated killer (LAK) cells demonstrated increased cytotoxicity against U12.B7 or Uad12.B7.

**ROLE OF GERMLINE p16 MUTATIONS IN DOUBLE PRIMARY CANCERS: PANCREAS AND MELANOMA. G. Lal, N. Lassam, D. Hogg, M. Redston, S. Gallinger. University of Toronto and Mount Sinai Hospital, Toronto, Ont.**

(Manuscript submitted for publication elsewhere)

**LACK OF CLINICALLY RELEVANT IDENTIFIERS IN HNPCC FAMILIES WITH MISMATCH REPAIR (MMR) GERM-LINE MUTATIONS. L.K.F. Temple, G. Darlington L. Madlensky, B. Bapat, J. Wright, M. Rodriguez-Gigas, R. Peruchio, T. Pal, S. Narod, S. Miller, R.S. McLeod, S. Gallinger. Mount Sinai Hospital and University of Toronto, Toronto, Ont.**

**Background:** Hereditary nonpolyposis colorectal cancer (HNPCC) is the most common form of inherited colorectal cancer (CRC).
**Objectives:** The objectives of this study were: (a) to evaluate the clinical differences in high-risk families with (M+) and without (M–) MSH2 and MLH1 gene mutations, (b) to evaluate the test characteristics of published clinical criteria and (c) to develop new clinical criteria to better discriminate between high-risk M+ and M– families.
**Methods:** A retrospective cohort of 91 high-risk families who met the Mount Sinai Hospital Registry criteria was accrued from 3 sources. The data were aggregated by family so that differences between M+ and M– families could be examined. The test characteristics of 3 published criteria were evaluated. Using multivariate logistic regression modelling, criteria to identify high-risk families with a mutation were developed.
**Results:** The mean age of earliest cancer occurred at a significantly young age in M+ families and the mean number of right-sided lesions within a family was significantly greater in M+ families. When compared with other published criteria, the Amsterdam criteria had the highest sensitivity (50%) and specificity (60%) for identifying M+ families. Using these 91 families, new clinical criteria with a sensitivity of 92% and a specificity of 38% were developed and included (a) one individual less than 45 years of age with an HNPCC-related cancer or (b) the presence of a case with multiple primary and more than 3 HNPCC-related cancers within a family.
**Discussion:** Although phenotypic differences exist between M+ and M– families, the differences are not as striking as expected, suggesting that MMR gene mutations alone do not define HNPCC.

**TUMOUR MICROSATELLITE INSTABILITY PREDICTS IMPROVED SURVIVAL IN A POPULATION-BASED SERIES OF COLORECTAL CANCER PATIENTS. R. Gryfe, H. Kim, M. Redston, S. Gallinger. Mount Sinai Hospital and University of Toronto, Toronto, Ont.**

(Manuscript submitted for publication elsewhere)

**SENTINEL LYMPH-NODE BIOPSY FOR MELANOMA OF THE TRUNK AND EXTREMITIES. THE MCGILL EXPERIENCE. F. Tremblay, S. Meterissian, H. Shibata, A. Loufti. McGill University, Montreal, Que.**

**Introduction:** McGill university experience with sentinel lymph-node (SLN) biopsy of melanoma of the trunk and extremities is reported. Patients with melanoma of 1 mm or more with clinically negative lymph nodes were eligible.
**Method:** Between October 1996 and December 1998 SLN biopsy was attempted in 36 patients (18 women and 18 men). Tc-99 filtered sulfur colloid (0.5 mci) was injected intradermally around the melanoma or the excision scar 10 to 15 minutes before the surgical skin preparation. The identification of the SLNs was done with a hand-held gamma probe (C-TRAK). Local anesthesia was used mostly for inguinal SLN biopsy, whereas general anesthesia was usually required for axillary SLN biopsy. Preoperative lymphoscintigraphy was used only for trunk melanomas.
**Results:** The mean age at diagnosis was 53.4 years (range from 22 to 76 years). The melanomas were distributed between the lower extremities (20 patients), upper extremities (8 patients) and

trunk (8 patients). The mean Breslow thickness was 2.35 mm (range from 1 to 8 mm), the Clark level was at least III. The lymphoscintigraphy accurately localized the lymph-node drainage basin for trunk melanomas. In 1 patient we were unable to identify the SLN because the radiocolloid failed to migrate, for a failure rate of 2.8%. The average number of SLNs removed was 1.97. Eight patients (23%) had positive sentinel nodes. The postoperative complication rate was 8.5%. Seven of 8 patients with positive SLNs underwent a complete node dissection (1 patient refused). Of 7 completion dissections only 2 had positive nodes other than the SLN. All patients with positive nodes received interferon as adjuvant treatment. With a mean follow-up of 396 days, 34 patients were alive with no evidence of disease, 1 patient with positive SLN was alive with distant metastatic disease and 1 patient with negative SLN was dead of disseminated disease.
**Conclusion:** SLN biopsy is a feasible technique with an acceptable failure rate and is thus a useful tool in the surgical management of melanoma.

### THE USE OF DIFFERENT SURGICAL STRATEGIES FOR EARLY BREAST CANCER IN ONTARIO AND THEIR INFLUENCE ON BREAST CONSERVATION.

**D. Petrik, D. McCready, V. Goel, S.P. Pinfold, C.A. Sawka. University of Toronto, Toronto, Ont.**

**Background:** There is significant variation in the surgical treatment of breast cancer in Ontario. Studies show that the rate of breast-conserving surgery (BCS) is affected not only by patient and tumour characteristics but also by surgeon and hospital factors. The surgical strategy used for the treatment of early breast cancer can either be a 1-step procedure, whereby the biopsy and definitive operation are done at the same time, or a 2-step procedure, in which the definitive operation is performed only after tissue diagnosis is obtained from a biopsy done as a separate procedure. These 2 strategies differ in both the timing of the decision and in the information available to the patient and her surgeon. The purpose of this study is to examine the patient, tumour, surgeon and hospital factors associated with these 2 different surgical strategies, as well as the effect this has on the operation performed (BCS versus mastectomy).
**Methods:** A random sample of 938 node-negative breast cancer patients was drawn from Ontario Cancer Registry and matched confidentially to 2 population registries (Canadian Institute of Health Information and Ontario Health Insurance Plan). The data on the final cohort of 643 patients included patient information, surgical procedures performed, tumour characteristics, surgeon characteristics and hospital factors. Using the axillary lymph-node dissection (ALND) to define the definitive procedure allowed identification of the 1-step group (ALND plus BCS or mastectomy in a single operation) and the 2-step group (surgical biopsy followed by ALND plus BCS or mastectomy). Univariate and multivariate analysis was used to study the associations between the patient, tumour, surgeon and hospital factors and both surgical strategy and operation performed.
**Results:** A 1-step procedure was the planned surgical strategy in 57% of patients. Those with palpable lesions were more likely to be treated in a 1-step manner (65% 1-step), whereas significantly more patients with nonpalpable lesions were treated in a 2-step manner (69% 2-step, $p < 0.001$). Other factors associated with a 1-step procedure in the 504 patients with a palpable mass were patient age more than 50 years, previous fine-needle aspiration biopsy, tumour size more than 1 cm, absence of extensive DCIS, surgery in a teaching hospital and a surgeon with an academic affiliation. Among the 139 patients with nonpalpable lesions, no patient, tumour or surgeon characteristics were significantly associated with the performance of a 1-step procedure. BCS was the planned treatment in 70% of patients, and this did not differ between the 1-step and 2-step groups (69% versus 70% respectively, $p = 0.870$). However, palpable lesions, larger tumour size, extensive DCIS and centrally located or multifocal tumours, were associated with lower rates of BCS.
**Conclusions:** The surgical strategy differed between patients with palpable and nonpalpable lesions, which is consistent with current guidelines. The rate of BCS was independent of the surgical strategy employed and was associated with several patient and tumour factors that are accepted as being important. This study shows that despite differences in the timing of the surgical decision, the surgical treatment of early breast cancer is appropriate and based upon important patient and tumour factors.

### DOES QUALITY OF SURGERY AFFECT LOCOREGIONAL RECURRENCE AFTER MASTECTOMY IN NODE-POSITIVE BREAST CANCER: TO RADIATE OR NOT TO RADIATE?

**S. Latosinsky. McMaster University, Hamilton, Ont.**

The use of adjuvant radiotherapy for premenopausal women with node-positive breast cancer after mastectomy has been recommended in 2 recently published randomized controlled trials (Overgaard et al. *N Engl J Med* 1997;337:949-55 and Ragaz et al. *N Engl J Med* 1997;337:956-62). These trials showed a reduction in locoregional recurrence as well as a survival benefit in the radiotherapy arm. The locoregional recurrence rates in the control arms, however, were perceived to be excessive (25% and 32% at 10 years respectively). Poor quality surgery might have resulted in these high recurrence rates and allowed for the benefits seen with radiotherapy. A median of only 7 axillary nodes reported in the trial of Overgaard and colleagues seemed to support this hypothesis. A look at similar patients at the Medical College of Virginia Hospitals (MCVH), where the majority of procedures were done by surgical oncologists, was undertaken to establish the locoregional recurrence rates with presumed superior surgical technique.
**Methods:** Node-positive stage II and IIIa breast cancer patients, treated with mastectomy at the MCVH, without adjuvant radiotherapy, and entered into NSABP trials between 1978 and 1993 were identified. Only NSABP records were used to identify cases in order to provide complete, prospectively collected follow-up data. Chemotherapy was used in all patients but varied as per NSABP trial. The number of axillary nodes and size of the primary were identified from surgical pathology. Follow-up records were reviewed for date and location of locoregional recurrence and date of last follow-up or death.
**Results:** A total of 137 patients were identified. The median

number of axillary nodes identified was 18. The locoregional recurrence for all patients at 10 years was 27%; 95% confidence interval, 19% to 36%. Of the locoregional recurrences, 50% were in the chest wall alone. Concerns with selection bias are somewhat alleviated by a reasonable 10-year survival for the series of 39%; 95% confidence interval, 30% to 48%. There was no observable change in locoregional recurrence over the time period studied.
**Conclusions:** Despite evidence suggesting improved surgical technique, no difference was shown in the locoregional recurrence rate in this case series compared with controls in 2 previously reported randomized controlled trials. Radiotherapy should be considered for all women with node-positive breast cancer, based on the results of these previous trials.

**LOCAL RECURRENCE IN BREAST CANCER — AN ISSUE OF QUALITY OF SURGERY. C.A. Giacomantonio, W.J. Temple. University of Calgary, Tom Baker Cancer Center, Calgary, Alta.**

**Background:** The controversy concerning the need for adjuvant radiotherapy after wide local excision of infiltrating ductal carcinoma (IDC) continues. Studies show that whereas adjuvant radiotherapy reduces the incidence of local recurrence it does not prolong survival. Adjuvant radiotherapy although well tolerated by most is expensive and not innocuous, with morbidity ranging from chronic pain to radiation-induced sarcomas.
**Objective:** To identify a subset of IDC patients in whom treatment with wide local excision alone would sufficiently reduce the risk of local recurrence to acceptable rates.
**Methods:** Two hundred and thirty-one patients with stage I and stage II breast cancer were treated at the Tom Baker Cancer Center (TBCC) in southern Alberta between 1981 and 1988. Treatment included wide local excision plus or minus chemotherapy or hormonal therapy. No patients received adjuvant radiotherapy as part of the initial treatment of their disease. The median follow-up was 60 months (range from 6 to 158 months). The primary end-point was local recurrence.
**Results:** Sixty-one of the 231 (26.41%) experienced local or local plus systemic recurrence. Age less than 40 years and lymph-node status (N > 3) were identified as significant factors influencing local recurrence by univariate analysis. Only lymph-node status (N > 3) remained significant with multivariate analysis ($p$ = 0.013). Results when surgery was performed by general surgeons versus surgical oncologists were compared. Both groups were similar with respect to patient age, tumour size and length of follow-up. Patients managed by general surgeons experienced a 28% local recurrence rate compared with 6.25% local recurrence when treated by surgical oncologists ($p$ = 0.048). When corrected for nodal involvement the difference continued to approach statistical significance ($p$ = 0.0574).
**Conclusions:** This study could not help to identify which patients could be spared adjuvant radiotherapy when treated by breast-conserving surgery. The group of patients treated by surgical oncologists experienced a significantly lower local recurrence rate, suggesting that surgical technique may be an overlooked and critical factor in reducing the local morbidity of breast cancer.

**MALIGNANT GASTROINTESTINAL STROMAL TUMOURS (M-GISTS) OF THE SMALL BOWEL: A REVIEW OF 33 CASES FROM A PROSPECTIVE DATABASE. J. Crosby, C. Catton, A. Davis, B. O'Sullivan, J. Couture, C. Swallow. University of Toronto Sarcoma Group, Toronto, Ont.**

**Background:** M-GISTs, formerly referred to as leiomyosarcomas, are rare mesenchymal tumours originating in the wall of the gastrointestinal tract. We reviewed the recent experience of a single tertiary care cancer centre to determine outcome and prognostic factors for M-GIST of the small intestine (SI M-GIST) as a defined group.
**Methods:** A prospective database was used to identify all patients referred with SI M-GIST between 1987 and 1995. Clinical and pathological data, treatment and outcome were analysed. Follow-up (F/U) was through visits to our sarcoma clinic and was continued regularly to the time of death ($n$ = 28). For patients who were alive at the last F/U ($n$ = 5), median F/U was 65 months (range from 19 to 101 months). Overall median F/U was 33 months (range from 3.5 to 176 months, $n$ = 33). Times to recurrence and death are measured from the date of the original resection.
**Results:** Thirty-three patients (19 men) with SI M-GIST were identifed. The mean age at diagnosis was 56 years (range from 36 to 75 years). All patients were symptomatic at presentation. The stage of the tumour at diagnosis was: localized in 9 (27%), locally advanced (invasion into adjacent organs/peritoneum) in 14 (42%), perforated in 4 (12%), diffuse (multiple primary lesions) in 3 (9%) and metastatic in 3 (9%). All patients underwent resection: 24 (73%) had complete gross resection, whereas residual local and/or metastatic disease was left in 9 (27%). In 24 patients at risk, local recurrence occurred in 14 (58%) at a median of 25 months (range from 4 to 81 months). Metastases developed in 20 of 30 patients at risk (67%) at a median of 22 months (range from 2 to 91 months). At last F/U, 5 patients were alive (1 without, 4 with disease). Two patients died disease free. Of the 26 who died from GIST, 6 had local disease only, 11 had metastases only and 9 had both. Overall survival (OS) and disease-free survival (DFS) at 5 years were 34% and 33% ($n$ = 33). Analysis of survival curves showed that OS was similar for localized and locally advanced disease; OS was also the same for diffuse and metastatic disease. Patients were thus divided into 3 stages: (1) localized or locally advanced; (2) perforated; and (3) diffuse or metastatic. OS and DFS times, in months, are shown in the table. Univariate analysis of potential prognostic variables showed that age, gender, tumour size, grade and tumour spill at operation were not significant. Stage at diagnosis ($p$ = 0.014) and complete resection ($p$ = 0.04) were predictive of longer OS and DFS.

| | | Overall survival, mo | | | Disease-free survival, mo | | |
|---|---|---|---|---|---|---|---|
| Stage | No. | Mean | Median | Range | Mean | Median | Range |
| I | 23 | 64.0 | 49.0 | 4.5–176 | 35.6 | 25.0 | 0–91 |
| II | 4 | 37.0 | 26.0 | 20–56 | 21.0 | 9.0 | 9–56 |
| III | 6 | 22.3 | 22.0 | 3.5–35 | 8.7 | 0 | 0–19 |

**Conclusions:** Most patients with SI M-GIST relapse following resection. Despite this, survival may be prolonged. Grade was not a significant prognostic variable, in accordance with the recent pathological literature. Stage of disease at presentation was a significant prognostic variable. Localized and locally advanced M-GIST have similar outcomes, with mean OS longer than 5 years. Patients with diffuse disease or metastases at presentation have an equally poor outcome. Complete resection is a significant prognostic variable and should be performed in the absence of metastases or sarcomatosis.

**COMBINED MODALITY THERAPY FOR SOFT-TISSUE SARCOMAS INVOLVING THE PELVIS. S.J. Lewis, J. Couture, J. Wunder, A. Davis, C. Catton, R. Kandel, C. Kotwell, B. O'Sullivan, R.S. Bell. Mount Sinai Hospital, University of Toronto, Toronto, Ont.**

Soft-tissue sarcomas involving the pelvis have not been reported as a separate entity before in the literature. Based on clinical experience, the hypothesis was that they were associated with a particularly bad outcome. The purposes of the review were to understand the anatomic extension of these tumours and to determine the outcome after radiation therapy and radical surgery. Eighteen consecutive patients presenting between 1987 and 1995 with soft-tissue sarcomas involving the true pelvis were retrospectively reviewed at a minimum follow-up of 18 months.

The tumours were confined to the true pelvis in 4 patients, extended to the retroperitoneum in 3 patients and to the thigh in 11 patients. Adjuvant radiation was given to all but 2 patients, who had been treated in the past. All patients underwent surgical resection (local resection in 13 patients, hindquarter amputation in 5 patients). Surgical resection had a high rate of morbidity and complications including positive resection margins in 9 individuals.

Of the 18 patients, 11 died at a mean of 15.5 months (range from 2 to 58 months), 4 were alive with evidence of disease at a mean time of 44.3 months (range from 18 to 68 months) and 3 were alive with no evidence of disease at a mean time of 57 months (range from 43 to 71 months). Soft-tissue sarcoma of the pelvis is fortunately a rare disease with a high risk of local and systemic disease progression despite aggressive local treatments. The bony limits of the pelvis and the particular mode of spread through the sciatic notch and obturator membrane are partly responsible for these poor results. New modalities are needed to address the high failure rate.

**THE CANCER CARE ONTARIO SURGICAL ONCOLOGY NETWORK. A.D. DePetrillo, A. Gagliardi. Cancer Care Ontario, Toronto, Ont.**

The Surgical Oncology Network (SON) was established by Cancer Care Ontario (CCO) to ensure that patients receive the necessary information, support and surgical cancer services as close to their home as possible. Phase 1 of the program involved recruiting specialty surgeons trained in surgical oncology to join multidisciplinary teams in 8 regional cancer centres. The second stage of the program will focus on improving communication. A needs assessment survey was mailed to all surgical specialists in the province and their feedback will be used to further define Network activities. Knowledge-sharing between regional cancer centres, hospitals, general and specialty surgeons, and family physicians will be promoted by implementing a Web site and newsletter. A database of surgical oncologists will be developed so that practitioners can identify colleagues for consultation when making treatment decisions and arranging referrals for their patients. Links with research groups have already been formed: SON will liaise with the Program in Evidence-Based Care to develop surgical oncology treatment guidelines and with the Institute for Clinical Evaluative Sciences to examine outcomes in cancer surgery. Cooperation between regional cancer centres, family physicians, community surgeons, and patients, as supported by the SON, will continue to improve cancer care across Ontario.