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#### DISCUSSION

DR. RICHARD E. WILSON (Boston, Massachusetts): I congratulate Dr. Michelassi and Dr. Block for this comprehensive retrospective review of rectal cancer treated between 1955 and 1981. The manuscript, which I enjoyed reviewing, extensively correlates biologic variables with prognosis for regional and distant recurrence and survival.

I generally concur with their observations. A similar review of patients with rectal cancer operated on at the Brigham Hospital confirmed that stage of disease was the most important indicator for recurrence and survival. The low rectal cancers recurred uniquely in the region of the disease rather than distantly, and this occurred also in this study. The data from this study showed the dangerous effect of endophytic lesions, and vascular and lymphatic invasion which are important risk factors. It must be stressed, however, that there are serious defects in the Dukes' staging system because the tumor size, extent of tumor involving the circumference of the bowel, and the site and number of involved lymph nodes are not a part of that staging system, and therefore there is a broad group of patients within each stage.

I was struck by the continued worse prognosis for black patients in this study. One could not help wondering whether or not with black patients generally having less appropriate medical care in this central city, that the stage of the disease, although the same, was at the much worse end of the spectrum for these disadvantaged patients.

The same was true for breast cancer in the American College of Surgeons study that we carried out, where the black patients had a continual significant worsening of prognosis without any definite stage or type differential.

Hopefully, newer studies using DNA analysis and histochemical classification, which are both available by biopsy before operation in rectal disease, might affect plans for surgery. I wonder if the authors have used this approach more recently?

However, my main comments relate to the potential for adjuvant chemoradiotherapy, especially with a cancer showing an important incidence of regional disease. Significant improvement in disease-free survival and overall survival was seen in the multicenter GITSG study where postoperative chemoradiotherapy showed significant differences from surgery alone, chemotherapy alone, and radiation therapy alone for both survival and disease-free survival in rectal cancer. The GI consortium is continuing with these trials as a prospective randomized approach to determine more effectively the interaction of chemotherapy and radiotherapy in rectal cancer.

These types of approaches will be necessary to alter the outcome for this disease, as I doubt that there is any difference in those life table survival curves in the past 30 or 40 years.

DR. CLAUDE WELCH (Boston, Massachusetts): I congratulate the authors on this article and I rise to support many of their conclusions, but I also have one of the same worries as Dr. Wilson has.

I want to touch primarily on the question of the pelvic lymph node dissection. Many years ago with a long experience by Dr. Meigs with this dissection for cancer of the female pelvic organs, particularly the cervix, the conclusion was reached that if this operation were done widely it would work well if nodes were not involved. However, if the nodes were involved, the patients had a tendency to die.

We as surgeons are much taken with these beautiful pictures of the lymph node dissection, but I believe we have to recognize that there is a great deal of further operating time and difficulty involved in the lymph node resection.

I would like to ask the authors how many of their patients who did

turn out to have positive lymph nodes survived the 5-year period?

I also want to call attention to the alternative method suggested by Dr. Wilson. Our series at the Massachusetts General Hospital has been following this particular line because we have been using postoperative radiation therapy for selected patients, with B-2 and C lesions, rather than wide lymph node resection. Our cases, of course, have been matched with historic controls. There have been no prospective studies that have been worthwhile so far, but they now are in prospect.

I ask the authors whether or not they believe that this might be a reasonable or even better alternative to their widespread lymph node dissection, and perhaps we could solve this problem which has been a rather burning controversy among colon and rectal surgeons for a long time.

DR. A. R. MOOSSA (San Diego, California): It is always an honor to discuss a paper from my former alma mater. The authors have set the gold standard for the surgical treatment of rectal cancer by reviewing their experience with patients treated between 1965 and 1981. The results are especially impressive for Dukes' C tumors. If my memory serves me right, George Block left the Astler-Coller scene at Michigan to join the University of Chicago around 1965. Hence, these superlative results are largely due to his personal efforts. A 3% operative mortality rate in 154 curative resections with no anastomotic leak is indeed impressive.

For the patient with rectal cancer, the end result is judged by two parameters: survival and pelvic-perineal recurrence. Dr. Block and his colleagues have used sophisticated multivariate regression analysis to identify factors that impact on patient outcome. They have confirmed our previous experience that Dukes' staging, vascular-lymphatic microinvasion, and histologic type are important prognostic factors. In addition, they have demonstrated that tumor morphology and race are two independent variables that also affect the end result.

I share Dr. Block's belief that the length of distal margin and pelvic lymphadenectomy are important but, unfortunately, due to relatively small numbers, the authors could not demonstrate statistical significance. I have three questions for the authors.

Is there any difference in outcome between male and female patients in this series, either in terms of survival or local recurrence?

Having delineated the prognostic factors after proctectomy, do they routinely give the high-risk patients postoperative adjuvant radiotherapy and/or chemotherapy?

Have they attempted to stage the patient before operation using CT scan of the pelvis or pre-rectal ultrasonography with a view toward giving preoperative radiotherapy to the most unfavorable lesions?

DR. JEROME J. DECOSSE (New York, New York): I do not believe that we have previously seen the presentation of the cells in relationship to prognosis. It is the best illustration I know of the interaction of prognostic factors and the cumulative effect of those not only for prognosis but also potentially serving as the basis for treatment selection of other adjuvant therapies. I congratulate the authors on this added contribution.

DR. GEORGE E. BLOCK (Closing discussion): Dr. Michelassi and I thank the discussants for their questions and for their kind remarks.

Dr. DeCosse, we are most appreciative of your generous comments about the cells that illustrated our findings. We believe that these conclusions are the major contributions of our work. I had asked Dr. Moossa to say the same thing, but he refused to do so. (Laughter)

Dr. Moossa, in answer to your question, we were surprised that there

was no difference between the sexes. I had anticipated, because of the ease of dissection and the more complete dissection usually obtained in the female pelvis, that we would demonstrate a favorable bias for the female; this did not appear.

As far as radiation therapy is concerned, for some time we have identified microinvasion and mucinous tumors as being determinant for local recurrence; these are the individuals for whom we have chosen postoperative irradiation. Until our analysis was completed we had not identified the other variables, but now we will use all identified prognostic factors in considering radiotherapy.

In this country somewhere between 10 and 15% of the patients have a local recurrence of rectal cancer after resection. Why then radiate the other 85%? We hope our paper is a contribution towards selection.

Unfortunately, one cannot always determine microinvasion and sometimes the mucinous characteristics of the tumor by preoperative biopsy. We usually require the entire operative specimen to make these determinations. We have not found CAT scans to be helpful in a precise determination of staging or for selection. Ultrasound, however, may be a more precise diagnostic tool.

Dr. Welch, the extent of lymphadenectomy was one of the arms of

our study. We were not able to demonstrate statistical significance. However, there appeared to be a favorable bias both in terms of local recurrence and survival favoring lymphadenectomy. The gross survival for patients with the extended lymphadenectomy was 60 versus 49%. The local recurrence was 9 versus 16%, but because of the limited numbers, these did not reach statistical validity. Our analysis stopped in 1981, but we hope in a few years to be able to have accrued enough patients to answer that question prospectively.

Dr. Wilson, the poorer survival of the black patients apparently did not have any socioeconomic connotation. Stage for stage, and in all multivariate analysis, there seems to be an inherent poorer prognosis for the black patients.

The second slide that Dr. Michelassi showed had all the various factors that we studied by our univariate and multivariate analysis. Of these we sifted down to four components that appeared to be independently and dependently influencing the outcome as determined by survival and by local recurrence of the rectal cancer.

We hope that this is a contribution that improves our ability for prediction of outcome for patient counseling, our selection of operation, and the use of adjuvant postoperative therapy.