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Discussion

Dr. A. P. Naef (Lausanne, Switzerland): I was very impressed with Dr. Paulson's excellent results and his, as always, masterfully presented analysis. I would like to present our modest experience from a slightly different point of view.

This slide shows our early mortality in a series of 435 resections for bronchogenic carcinoma (pneumonectomy 8.2%, lobectomy 2.5%, segmentectomy 2.3% sleeve-resection 3.4%). While operative mortality definitely is related to the type of resection, long-term survival depends as much on the correlation between host-resistance and tumor-growth potential as on the surgeon's intervention.

We have been interested in the evaluation of function sparing resections, in order to influence not so much the length, but the quality of survival. There is a strong hint that most lung cancer patients at the time of diagnosis or operation have already passed from a preclinical phase to a stage of a more or less pronounced systemic dissemination. Whether or not this dissemination is discovered depends on our still insufficient and crude diagnostic methods. Consequently, "curative" resection may often be an illusion anyhow. On the other hand, it is conceivable that so-called maximum tumor reduction by "palliative" or "incomplete" resection enhances host-resistance.

(Slide) Analyzing our 73 economic, segmental, and bronchial resections, we have been able to confirm that quality of survival is certainly improved by resection, whatever the criteria of selection. As to long term survival, it seems that patients with a well-localized radically resected tumor have a very good, almost 50%, chance of "cure", as demonstrated by our results in 20 such economic resections "for cure". However, even the series of far-advanced carcinoma patients occassionally yield a surprisingly good result, as Dr. Paulson's survivors with positive mediastinal nodes have also shown. In addition, many more patients have a worthwhile, even if only limited survival.

Confronted with the essentially unpredictable results, we believe in liberal selection, in order to give every possible patient a chance to fight his potentially disseminated carcinoma, once the local growth is removed. In these cases conservative resectional procedures probably should be combined with adjuvant therapy to keep the disseminated carcinoma disease in check.

Again let me tell you how much I enjoyed Dr. Paulson's paper, and the meeting as a whole. Thank you very much. (Applause).

Dr. Davila (Detroit, Michigan): I would like to draw attention to another aspect, perhaps somewhat along the lines of that commented on by Dr. Naef, in regard to the management of survivors of surgery for cancer of the lung. This is an area which was studied by my associate, Dr. Magilligan, who will be presenting the details of this in Los Angeles.

In 1954, Knight at Ford Hospital, reviewed 6900 autopsies and found among those who had carcinoma of the lung 51% had lesions in the brain. A number of these were isolated, single lesions in locations which he proposed might be removable.

We have reviewed 22 patients, treated over the past 15 years at Ford Hospital, who had carcinoma of the lung and solitary intracranial metastases either at the time of their thoracotomy or subsequently.

These were grouped into three categories: good, fair, and poor results; the good results implying survival for more than a year and symptom-free for more than a year, included 7 cases.

The survival after thoracotomy, after craniotomy, was >95% and the symptom-free interval in this group of 22 patients was excellent. Among the Group I cases there are currently only three survivors, but of interest is the fact that the survival time and the symptom-free time in these patients after removal of their single cranial metastasis has been quite encouraging, and has afforded them a much better quality of life. Several of these patients have had a second craniotomy, with additional survival. Three patients are alive as long as 4 years and 3 months after thoracotomy, 3½ years after craniotomy, and symptom-free, in one case, 3½ years after craniotomy; the other two for lesser intervals but significant periods of symptom-free life. I would like to point out that the surgical mortality rate in these 22 craniotomies has been very low (<4%). The overall survival has been quite substantial. Ten of 22 patients (45%) have lived for more than one year. The average has been 14 months for the group. There has been a group (three-quarters of the series) with at least 3 months free of symptoms; and about one-third of the series were free of symptoms for more than a year.

I would be very interested in Dr. Paulson's comments as to the management of these unfortunate individuals who are, obviously, salvage and palliation problems.

Dr. C. Barber Mueller (Hamilton, Ontario): This paper by Dr. Paulson is a remarkable testimony to continued interest and unremitting efforts to salvage something or someone out of a large group of patients who develop carcinoma of the lung. I must commend him, his excellent record keeping and his followup.

The base reference group here is those patients who were subjected to an operation, and, unfortunately, in such a study the total group at risk is of undetermined size, shape, and composition. Once again, I have a few slides to show, to indicate the severity and magnitude of the problem that Dr. Paulson attacks, the difficulty of dealing with only a portion of the group, and the inherent complications in selection for better cases or staging.

In a three-year period in Hamilton, Dr. Herbert Sullivan and I collected 594 cases with cancer of the lung. Three and a half years later, after the last case had been entered, every case was identified as to status, alive or dead, and dead of what cause. Every patient was found. There were none lost to followup.

Using life table analysis, the decay curve of this group is presented. Note here that there are 12% women, and their decay curve is almost exactly the same as for men, despite the fact that the spectrum of tumor diagnoses was quite different between the women and the men, and the women were developing tumors of a type which were thought to be less malignant, or more benign.

And another way of putting this; if you take half-time, note that half of the men were gone in only 6 months. The average age of this group of men was 65, and average expected longevity for men of 65 is 14 years.

When the entire group was examined, the picture was even more dismal. Of the dead, 96% died of their cancer, and another 2.5% died with those physicians who cared for them believing that cancer was a contributory cause.

I have two more slides to show you. One is the pitfalls of case selection. This is a poor slide, because it has two points to make and that is bad pedagogy.

Up here I have proposed that there be 300 cases, which will have 170 deaths. Dr. No. 1 staged them 100, 100, 100, into groups A, B, and C, the mortality rates being here 30, 50, and 90; whereas

Dr. No. 2 comes along with a little different staging technique and divides them up into 80, 110, 110. He has a mortality rate of 12.5% in Stage A, and will conclude that his Stage A management is better than the Stage A management of Dr. No. 1.

When one stages from any total group, one has the problem that Dr. Paulson showed so clearly. If the total group has a demise curve like this, a subset called Stage A, which looks better than the total group, is always paid for by another subset called Stage C, which is worse than the total group.

The moral of all of this is that every time you consider case selection for better results remember, it's a tough world.

DR. DONALD L. PAULSON (Closing discussion): There's a great deal of controversy about the significance of mediastinal node involvement. Much of the confusion arises from the fact that the precise location of the nodes is not always delineated, nor the type of nodal involvement. The Swedish surgeons, Drs. Bergh and Scherstén, Dr. Carlens, have carefully noted the location of nodal involvement, whether it's ipsilateral or contralateral, and the type of involvement, whether it is perinodal (extracapsular) or intranodal.

Perinodal involvement predominates in all cell types. No patient with perinodal involvement lived over two years after resection in their series. Intranodal metastases were found in only 15% of the patients. Survival at 3 years with this type, ipsilateral and intranodal, was better than 50% in a small group of patients.

Carlens has suggested on the basis of these findings regarding the stage, location, and extent of nodal involvement, that those patients with contralateral spread of perinodal extent be excluded from operation. Among patients with invaded mediastinal nodes, there will remain 12% located ipsilaterally, with intranodal involvement only. Taking into account the surgical mortality of resection for these lesions, a figure results which corresponds with the survival figures for Stage 3 lesions, not only in our series, but in all accurately staged series, as far as lymph nodal involvement is concerned.

Only 13 cases (6–8%) with mediastinal node involvement survived 5 years in our series, and all of these were ipsilateral, at a low level, and in retrospect we would interpret them as being intranodal. Only 3 such cases survived 10 years, and two cases, 15 years.

I think this points up, as far as surgeons are concerned, the importance of selection. I would also refer to Dr. Davila's discussion in the same vein, that the stage of the lesion in regard to nodal involvement would greatly influence me, as far as resecting cerebral metastases.

I'm very grateful to Dr. Mueller for his discussion, and followed his excellent paper on breast cancer presented a year ago before this Association with a great deal of interest in preparing this material. I can say, however, that I am a surgeon, and thinking positively, we have presented a series of pulmonary resections performed selectively for bronchogenic carcinoma with good long term results.

The efficacy of resection for bronchogenic carcinoma in our experience improves with selection based on staging. Judged by relative survival rates presented on a semi-log plot, the slopes of these curves after 5 years level off, assuming a near horizontal curve segment.

I understand Dr. Mueller's points, but I submit that in this paper we are only presenting the results of a series of resections for bronchogenic carcinoma performed over a 25 year period.