

Surgical Treatment of Female Genital Cancer

by

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In considering the surgical treatment of female genital cancer, it would be interesting to find out to what extent results would be improved by the combination of radiotherapy with the operative procedures.

First of all, however, I must reiterate the general principles on which surgical and radiotherapeutic techniques are based, in the management of malignant disease. Surgery aims at eradicating the growth by total ablation of the tumour. It fails where tumour deposits have occurred beyond the area of the radical excision, and this failure tends to occur in the more malignant, anaplastic growths. Radiotherapy, on the other hand, depends for its success on the destructive effects of ionising radiation which kills off malignant cells more easily than it does the normal cells. Radiotherapy fails where the tumour requires for its total destruction a dose of ionising radiation greater than it is technically possible to deliver, in view of the limited radiation tolerance of the normal tissues.

It would be ideal if we could by some method or other determine which growths would do better with surgery and which with radiotherapy. But, so far, the histological methods of Glucksmann and the cytological methods advocated by Graham, have not found universal application.

Under the circumstances, it would be reasonable to assume that surgery combined with radiotherapy should yield better results than either method alone, for it could then be possible to salvage the failures of one modality of treatment by the other. However, this has not always proved to be the case in clinical practice. And the reason for this is not difficult to understand when we bear in mind the factors that influence radiation response of normal and cancer cells. The sensitivity of the tumour tissue to radiation

is reduced in the presence of (i) physical trauma, (ii) infection and (iii) anaemia for these factors have the effect of reducing the oxygen tension in the tissues. After radical surgery the trauma, fibrosis and reduced blood supply would therefore adversely affect the response of the tumour to radiation. On the other hand, if radical radiotherapy is given first, an extensive operation cannot be carried out to the best advantage because the inflammatory reaction and fibrosis following radiation would make operation technically difficult. It must also be realized that wherever a combination of surgery and radiotherapy is carried out the incidence of radiation injuries increases greatly since the presence of trauma, infection and anaemia impairs the repair of tissue that has been injured by radiation.

Bearing in mind these difficulties, let us consider the different methods of combination that have been clinically used in some of the common female genital cancers.

1. Cancer of the cervix

Two main methods can be considered: (i) preoperative radiation and (ii) postoperative radiation.

i) Pre-operative radiation

One method of pre-operative radiation is to give full radium treatment followed by Wertheim's Hysterectomy; the other method is where after full radium treatment, a lymphadenectomy is carried out.

a) Radium + Wertheim's Hysterectomy

Here full intracavitary radium is carried out using any of the standard techniques or their modifications (e.g. Manchester, Stockholm, Paris

etc.). About six weeks later when the acute inflammatory response has subsided, a Wertheim's hysterectomy is carried out.

Not many full scale controlled studies of this method of treatment have been carried out. But the general impression is that the combined treatment gives slightly better results than either surgery or radiotherapy alone. There is, however, a distinct increase in morbidity when this combination method is used because of the rise in radiation injuries.

The following table gives the results as reported by Blaikley and his colleagues.

The points to note are (i) that this is not a controlled clinical trial. (ii) that the numbers treated with radiotherapy alone are considerably greater than those treated with surgery alone or surgery + radiotherapy. Another interesting point is that in Stage I cases there is no improvement with the combined method, whereas we would expect better results if we postulate that a certain proportion of radio-resistant growths would be salvaged with surgery.

More recently, Decker and his colleagues published the results of treatment of 115 cases of carcinoma of the cervix with radium followed

by radical surgery. This again is not a controlled study and there is a strong degree of selection as only the fittest patients were subjected to the combined treatment. Although there was an improvement in survival rates with this method of treatment, the authors felt that the continuance of this combined method was not justifiable because of the marked increase in complications, particularly vesico-vaginal fistulae and uretero-vaginal fistulae. 33 of their patients or 29% had severe complications.

b) Radium + Lymphadenectomy

This method is based on the assumption that metastases in the lymph nodes are radio-resistant and therefore must be surgically excised. This concept must be regarded as erroneous because given adequate radiation, especially with the modern supervoltage machines, secondary lymph nodes in the pelvis can be successfully destroyed.

The results with this combined method have been most distressing as far as morbidity is concerned. Gray & Frick evaluated the results of 55 cases subjected to this regime of treatment and found severe complications in most of them. Only 14 patients escaped complications, which included severe, progressive lymphoedema. The

First planned treatment	Total	No. of cases			5 year survival rate		
		I	II	III	I	II	I & II
Wertheim's hysterectomy (8 patients also had post-operative deep X-ray therapy)	33	18	12	3	66.6%	33.3%	53.3%
Pre-operative radium & Wertheim's hysterectomy (14 patients had post-operative X-ray therapy in addition)	89	50	37	2	65.0%	54.0%	60.9%
Radiotherapy alone	505	96	253	156	66.6%	48.6%	53.5%

survival results were not significantly better and certainly were not superior to those of the best centres using either surgery or radiotherapy alone. This method of treatment has therefore been abandoned by most centres.

ii) *Post-operative radiotherapy*

Post-operative radiation may be given if there is reason to believe that there is residual growth following operation. The chances of cure under such circumstances would then be rather remote.

Post-operative radiotherapy should not be used as a planned radical treatment. This is because radiation is relatively ineffective in the presence of a poor blood supply following radical surgery, and secondly because it is technically difficult to deliver a cancericidal dose of radiation to the pelvis in the absence of the uterus and upper vagina which act as radium containers.

In this connection I would like to point out that the availability of radiotherapy should not make a surgeon operate on inoperable cases because no amount of radiation can save a patient who has had inadequate surgery and in whom there has been dissemination of disease.

2. **Carcinoma of the Corpus Uteri**

In contrast with carcinoma of the cervix, the value of pre-operative radiation in this disease is widely accepted.

Radiation produces a shrinkage of the tumour, reduces viability of the cancer cells even if it does not completely destroy them and thus minimizes the incidence of vaginal vault recurrences. That it is possible to destroy the adenocarcinoma of the uterus with radiation has been shown by Kottmeier using Heyman's technique of filling the uterus with radium sources. The Manchester technique of radium application with additional intrauterine sources, can be employed in the pre-operative treatment of carcinoma of the corpus uteri. About 6 weeks after the radium application total hysterectomy and bilateral salpingo-oophorectomy is done.

Corscaden has gathered together the results of treatment of carcinoma of the corpus by various authors and showed the superiority of the

combined method over treatment by surgery alone.

McKelvey, however, states that prognosis in carcinoma corpus depends entirely on operability rates and is not influenced by pre-operative radiation. But where the growth has extended to involve the cervix he concedes that pre-operative irradiation has a value in preventing vault recurrences.

Post-operative radiation is probably less effective than pre-operative treatment in view of the poorer blood supply and the less amount of radium that can be accommodated in the absence of the uterus and upper vagina.

The fact that we do employ post-operative radiation in this hospital is brought about out of necessity by our long waiting list for radium appointments.

3. **Carcinoma of the Ovaries**

The cystadenocarcinoma is relatively resistant to radiation and therefore if the operation has been radical there is no necessity for a routine post-operative radiation. However, Del Regato states that results are generally better where routine post-operative radiation is instituted; and with the availability of supervoltage therapy more post-operative radiation is likely to be given.

Where the excision has been incomplete post-operative radiotherapy should definitely be given as this is a useful palliative measure and prolongs life even if it fails to cure. The idea of leaving the uterus behind in such cases in order to give radium treatment would appear to be illogical as the intracavitary radium is not likely to deliver adequate dose to the whole pelvis; and this procedure leaves behind an organ potentially involved by tumour.

Where there are peritoneal seedlings, instillation of radioactive gold (Au 198) into the peritoneal cavity after removal of the main tumour mass would be of value. However, since this radioisotope is mainly a beta-emitter it would be effective only if the seedlings are not more than about 3 mm in diameter.

The use of radioactive colloidal gold is also beneficial in the control of malignant ascites in ovarian carcinoma.

Solid tumours of the ovaries are not usually very radiosensitive, with the exception of the Dysgerminoma. The latter should therefore be given post-operative radiotherapy, whereas the other tumours should be irradiated only when the excision has not been complete.

In conclusion I would like to point out that with the availability of supervoltage apparatus with its capacity to deliver better depth doses there would be the tendency to give radiotherapy for a larger variety of tumours. However, there should be no over enthusiasm in combining supervoltage therapy with surgery as the complications following the combined method would be just as great as, if not greater than, that following conventional deep X-ray therapy and surgery.

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