The principles of breast cancer surgery

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Summary

The rationale for the treatment of patients with early breast cancer has changed considerably over the last 20 years. The management of the disease must now involve an integral approach taking into consideration the many developments that have occurred and how these have affected orthodox therapy. Because of advances in radiation technology, and also because patients are now presenting with tumors of much smaller size, the trend in treatment has been towards more conservative surgery. However, techniques have had to take into account a number of developments which have materially changed our concepts of what needs to be accomplished: 1) treatment must ensure local control of disease; 2) it must supply sufficient tumor tissue for histological and biochemical analysis; 3) it must be compatible with the use of adjuvant therapy; 4) it must give full information on axillary node status.

At present only the radical mastectomy or its modified version has been proved to be effective whilst fulfilling all these criteria for treatment. Nevertheless new conservation techniques are now being tested which may allow the breast to be conserved whilst at the same time safely treating the patient and providing the surgeon with all the information needed for future management.

Introduction

In early breast cancer the principal aim in the management of the primary complex is either to cure the patient or, if this is not possible, to render her free from disease for as long as possible. This may be attempted by local surgery and/or radiotherapy or by a combined approach using additional chemotherapy or endocrine therapy.

The best way to accomplish these aims is a matter for continuing investigation. The proponents of multicenter clinical trials rightly stress that the more patients that are entered into such trials, the sooner the answers will be forthcoming. In an ideal world, all patients would be treated in the context of the clinical trial, the precise therapy being determined by the current problem to be investigated. But this is not an ideal world and indeed the treatment of very few patients is determined in this way. Moreover, it is extremely unlikely that the situation will materially change in the foreseeable future. How therefore should the remaining patients be treated? Presumably, each practicing physician must identify what he considers to be the best therapy at the time the patient is seen and it is unfortunate that the clinical trial proponents do not always address themselves to giving pragmatic advice of this nature. As circumstances change, policies will change, but a rational understanding of the situation as it is today is essential if a decision is to be reached on the likely best treatment for the individual patient who develops breast cancer.

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A rational approach to treatment must take into account the results of recent clinical and scientific investigation and the way these affect orthodox therapy. The resulting synthesis of traditional and developmental influences will determine current clinical practice.

This paper will briefly review the history of the surgical treatment of breast cancer, indicate the way this is being modified by new developments and suggest a logical approach to the management of the disease today.

**Historical background**

In 1896 Halsted (1) published his paper describing the radical mastectomy. This description of the ideas of a number of practicing surgeons at that time formulated the first logical approach to the management of the primary complex. In effect, the radical mastectomy established the following concepts for the surgical treatment of cancer: 1) the tumor itself must be removed together with the organ in which it lies, i.e. the breast; 2) included in the excision must be the adjacent tissues into which the cancer might spread – in this case the overlying skin and underlying muscle; 3) the site of primary lymphatic spread must be removed with the tissue in between en bloc – in the case of the breast, this meant the removal of the axillary lymph nodes in continuity. By carrying out the dissection in this way it was intended that at no time did the surgeon cut through cancer tissue.

These principles became the basis for operations on cancers of many sites. In early breast cancer, the Halsted radical mastectomy became orthodox therapy and was almost the only operation which was used to treat the primary disease during the first half of this century.

Then, in the late 1940s and early 1950s, doubts began to be expressed both by surgeons and radiotherapists as to whether the Halsted radical mastectomy was necessary in every case. These doubts were expressed for two reasons. First, it became obvious that surgeons were now seeing primary breast cancers presenting at a much earlier stage than had been the case in Halsted’s day – indeed his patients included those who presented with ulcerating or fungating lesions, frequently attached to the underlying structures, with masses of adherent lymph nodes in the axilla and often also with palpable nodes in the supraclavicular fossa. All are features which would nowadays render the tumor inoperable. By the middle of this century, patients were presenting with lesions often no more than one centimeter in diameter and, with the advent of mammography, surgeons were being asked to treat cancers which were completely impalpable. Quite rightly, questions were asked as to whether the radical mastectomy was in many cases an unnecessarily extensive operation.

Secondly, came the realization that – possibly because of the rapid advance in technology during the second world war – radiation therapy could now be administered with a high tumoricidal effect but with little damage to the surrounding normal tissues. This combination of high technology radiation therapy, with minimal infiltrating disease, suggested that more conservative surgery might be effective.

In 1948 McWhirter (2) reported on a series of patients who had been treated by simple mastectomy with radical radiotherapy to the axilla and supraclavicular fossa and suggested that the treatment gave similar results in terms of recurrence and survival to the radical mastectomy. Subsequently Mustakallio (3) in Finland and Crile (4) in the United States began advocating the use of simple excision of the tumor followed by radiation to the breast and gland fields. Such treatment was taken up with enthusiasm in many countries and in France, in particular, therapists pioneered the use of radiation therapy in the primary treatment of the early lesion.

By the early 1960’s, it became evident that more conservative therapy was probably adequate in a number of cases of primary breast cancer. It began to be suggested that when the patient was first seen at the clinic either the disease had already spread through the blood stream and hence no local operation would be curative or – and possibly less likely – the disease was contained within the breast and could be effectively treated by local means. A rather nihilistic attitude developed in those who