IN VIVO AND IN VITRO STUDIES OF APPLICATION OF ULTRASONIC
VISUALIZATION TECHNIQUES FOR DETECTION OF BREAST CANCER

Elizabeth Kelly Fry, M. Stephen Gallager\textsuperscript{1} and Thomas D. Franklin Jr.,
Interscience Research Institute, Champaign, Illinois 61820.

This paper is concerned with the results of a long-term
study of the feasibility of using ultrasonic techniques for
the detection of breast cancer. A B-scan (sector) visualization
system with an on-line digital computer was used.\textsuperscript{2} The computer
not only provides the advantage of an automatic scanning system
but also allows the operator to control the gain of the receiver
amplifier so that it is optimal for specified range intervals in
the tissue. The approach used was to initially obtain visualization
data on the breast of normal subjects covering the age range
of young to old, and to then apply this information as a basis of
interpretation of data obtained on subjects with benign and malignant
breast pathologies. In addition, in vitro visualization
studies were carried out on excised whole breast. The data revealed
in the echograms of the excised whole breast were correlated
with information provided by histological studies of whole breast
sections.

A number of apparently significant results accrued from this
study but one of the most important is the finding that there is
a difference between the characteristics of malignant tumors loca-
cated in breast, insofar as acoustic visualization is concerned, and
and the characteristics of malignant tumors located in soft body
tissues other than breast, such as brain tumors.

\textsuperscript{1} M. Stephen Gallager, M.D.; M. D. Anderson Hospital, Houston.
\textsuperscript{2} W. J. Fry, et. al., JASA 44(5): 1324–1338, 1968.
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