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“Diagnostic Evaluation of Fine Needle aspiration Biopsy, in various Breast Tumors”:

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‘Abstract’


Results: In Cases Of Complete Tumor Resection, Rendered Possible Using Available Clinico-Stero-Tactic Guided FNACs Techniques, With Biopsy Proved Tumor Free Resected Margins, No Or Minimal Recurrences (Loco-Regional, Systemic Etc.), Complications Were Observed, Especially In Carcinoma Cases, Patients Were Able To Be Managed By Chemo-Endocrinal Supportive Measures, In Non-Compliance & Or Non-Availability Of Appropriate Radio-Therapy Regimes.


‘Key-Words’

Tumor (Benign/Pre-Malignant/Malignant) BreastConservationSurgery (BCS) 1; Pre-Surgical Tumor Localization Procedures 2; Clinico-Stero-Tactic Peri-Lesional FNACs (USG, Mammography Etc.) 3; Breast Conservation Therapy (BCT) Components Comparative Modules 4;
'Introduction'

For Tumor Surgery, Pre-Surgical Lesion Localization & Disease Extent Assessment By Various Available Clinico-Diagnostic Methods Formed The Basic Fundamental Of Maximal Curetive Surgical Help To The Patient, By Removing Pathology To Justifiable Permissibilities, With Varying Availabilities Of Supportive Therapies Needs AfterWards.


Due To Knowledge And Availability Of Increasingly Effective Radiotherapy, Systemic Neo-Adjuvant, Adjuvant Therapy; Early Detection Screening, Diagnostic And Prognostic Factors, For Loco-Regional And Distant Disease Control. BCT (Breast Conservation Therapy) Can Be Treatment Of Choice, Avoiding Mutilating Procedures And Thus Psycho-Social Trauma.

Breast Conservation Therapy (BCT) Components:

(A) Surgery: As For Any Surgical Procedure, The Essential Object In BCS Being;
2. While Minimizing The Margin Involvement Chances,
3. Planned With An Aim Of Best Cosmetic Results, On Long Term Basis.

The Different Terminology For Various Surgical Procedures Include: Quadrantectomy, Sector Excision/Resection, Lumpectomy (Tylectomy), Wide Local Excision, Etc.

(B) Radiotherapy: An Integral Part Of BCS, While BCS Without Radiotherapy, Being An Important Consideration, In Non-Compliance, No Proper Availability Circumstances.

(C) Systemic Adjuvant & Neo-Adjuvant Therapy: Chemotherapy, Hormonal Therapy Including Ovarian Ablation, Chemo-Endocrinical Therapy Etc.

BCS & BCT Over All Success Rate Determinants:

Amongst Large No. of Clinical & Pathological Factors Responsible Like,
1. Resection Margins: Prevention & Management Achieved By Acceptable 2-3Cms. Surrounding Normal Tissue
2. Histological Types & Grade: Out of 2 Tumor Types: Lobular & Ductal, Lobular Is Having High Tendency for Multicentricity & Wide Infiltration & Hence Requiring Carefully Administered BCT Components

3. Other Factors:
• Lymphatic Vessel Invasion,
• Vascular Invasion
• Axillary Node Involvement, Nodal Involvement Not a Significant factor for Recurrence: No ContraIndication for Surgery,
• Multiple Primary Tumors: Recurrence Rate (BCT); Solitary Tumors: 10% Multiple Prim. Tumors: 25-40%; Absolute ContraIndication,
• Tumor Size: Upto T2 Lesions (3-5 cms.), Tumor/Breast Ratio,
• Age Of The Patient: Young Age Group: 35-40 Years Age, High Recurrence Rate.

While Other Poor Prognostic Factors Including Extensive Intraductal Component (EIC) The Previous Concept Index Lesion Comprising at least 25% Intra ductal carcinoma (DCIS), & Presence in the Adjacent Normal Breast Tissue, Changed To Modified Indices: 50% Index Lesion has to be Composed of Intra-Ductal Carcinoma, Along with its Presence in Adjacent Breast tissue

Availability Compliance Of Appropriate Radio-Therapy, Neo-Adjuvant / Adjuvant Systemic Chemo-Endocrinical Therapy, The Basic Pillars Needing Essential Securement For OverAll Management Success.

Sentinel Lymph Node Biopsy Technologies,
Histological Grading,
DNA Ploidy,
S: Phase Fraction
ER, PR & Other Recently Available Diagnostic Tools.

Management Of Local-Regional Recurrences After BCT, Large Variation, Loco-Regional Recurrence Rate, Distinction Between, A Recurrence & New Primary Lesion Needs Detailed Histological Examination
- Conservation Surgery in a salvage situation: Not Recommended, Due to High Recurrence Rate of Re-Conservation Surgery.

The Present Study Deals, With The Objective Of Minimizing ‘Resection Margins Determinants’ Factor Of Success Rates, By Securing Appropriate Tumor Resection (Tumor Free Margins Confirmation Histo-Pathologically), By Pre-Operative Tumor Localization Assessment Methods: Radio-Diagnosis, Histo-Pathology, Lab. Investigations Available Tumor Markers, Supported By Expert Clinical Examination Etc.
Stero-Tactic Peri-Lesional FNACs From Variety Of Breast Tumors, Achieved With Accurate Efficiency Using Available Clinico-Radio-Diagnostic Methods (MammoGraphy, USG Etc.), While OverAll Treatment Result Outcome Comparative Evaluation, Appraised In Accordance With Defined Parameters, Retained Scientific & Statistical Logistics For Success Rates Assured & Ensured With Pre-Surgical Tumor Evaluation Techniques.
‘Material & Methods’
The Present Study Includes, About >100 Patients Of Breast Tumors: Benign, Pre-Malignant, Malignant & Especially Recently More Prevalent Vague & Or ill-Defined Margins & Or Varigeated Consistencies Of Different Aetio-Pathological Variants Lumps With/WithOut MicroCalcifications Etc.
Peri-Lesional FNACs Were Obtained, In Different Axis, Essentially (2) Vertical & Horizontal Directions, While For Depth From OverLying Skin,Fibro-Fatty Breast Tissue & Tumor Extent Posteriorly ToWards UnderLying Anatomical Structures, Pectoralis Fascia, Muscle Etc. 3rd Dimensional (Oblique,Tangential)FNAC Tissue Samples Were Secured, Using Aspiration & Or Spinal Needles Cautiously,As Per Needs.Diagram[ ].

Gradually Available FNAC Syringe Suction Mounting Appliances, To Recently Available Different Pre-Pack Sterile Biopsy Guns,Core Needle Biopsy Appliances Etc., Have Been Utilized As Per Need & Availability.
A Comparative Clinical Trial Evaluation Of All Cases, Retaining BCS Fundamentals Of Optimal Resection & FUC EitherWise,Specially,In Regards To Recurrence(Local/Systemic), ?Need, ?Need Extent Of Adjunct & Or Supportive Therapy, Components Of BCT Modules, With Comparative Evaluation For OverAll Survival Rate, Quantity & Quality Life,Recorded.
The Statistical Analysis
Pre-Operative Proper Localization,Assessment Of Breast Lesion, A Prime Important Factor To Ensure Proper Lesion Resection / Excision SuccessFull Surgical Help To Patient, In Consideration Of Tumor, Benign / Pre-Malignant, Malignant Grade Status,Breast / Tumor Ratio, Cosmesis & Other Special Reference Emphasis Different Aspects Studied.
Technique


Method

- Proper Skin Cleaning With Sterile Soap & Or Absolute Alcohol.
- Local Anaesthesia: Usually 1-5 ML Lidocaine (2%) AST. Is Infiltrated To Needed Accessibility.
- In Collaboration With Authentic Clinical Examination GuideLines:
- With Available Digital Mammography, Time Needed For Needle Localization, 20 To 30 Minutes, Have Been Reduced To 50%. While Comparatively Difficult Localization Of Microcalcifications & Vague Masses, Became Easier.

For Mammographic Aided Localization: Several Available Devices Include;
- Special Fenestrated Compression Paddles & Multitude Of Needles, e.g. Straight Needles, Hook Wire System, Stiffener, Curved J-wire, Barbed Type Hook Wire Etc.
- Needle Wire Assemblies
- Bracketing Localization Devices For Large Lesions
- Localizing Dyes Eg. Methylene Blue: Disadvantages; - Rapid Diffusibility, - Estrogen Receptor Prolactin Binding Capacity, Overcome By: Isosulfan Blue, Toludine Blue Dyes.

- Specimen Radiography: Procedure Allowed Documentation For Evidence Of Pre-Operatively Localized, Excised Tissue & Location Of Abnormality To The Pathologist

Localization Procedures Potential Complications: Bleeding, Infection, Vasovagal Reactions Etc., Can Be Avoided By; 1. Single Prick Efficient Reach To Tumor Technique Using Large, Suitable Bore Needle, Maintaining Asepsis Precautions, Patient Compliance And Use Of Local Anaesthesia
While Chest Wall, Pleural Injuries Leading To Pneumothorax Etc., Are More Common In Anterior Approach Then Chest Wall Parallel Approach

Potential Intraoperative Complications, Include Migration Of Wire And Surgical Resection / Cutting Of Wire, Are Avoided By Cautious & Careful Handling And Cutting.
Pre-Surgical Needle Localization,
Various Specialized Views
Bracketing Localization: Large Breast Tumor, Specialized Views
Localization Retroareolar Lesions: Various Specialized Views
USG Mammography Guided Perilesional FNACs

In Collaboration With Definite Support Secured By Discrete Clinical Exam. Expertise, Proper Depth Penetration Mammography X-Rays Tumor, Surroundings Accuaintance Etc.,


Methodology: USG Mammography Guided FNACs, Performed In Accordance With The Basic Fundamentals Of Cinico-SteroTactic Guided FNACs As Follows;
- At About (4) Perpendicular Points Of Tumor, Is An Important Guidance Tool For Tumor Resection Extent, By Providing Comprehensive Information Regarding Tumor And Surrounding Tissue
- Another One Or Two (1 Or 2) Selected Points Can Be Ascertained And FNACs Performed, For 3 Dimensional Advantage(e.g. Depth From Skin Surface, Distance From Underlying Anatomical Structures:Fibro-Fatty Breast Tissue, Pectoralis Fascia, Pectoralis Minor & Major Muscles Etc.). Diagrams[ ]
- For Retro-Areolar Lesions, Different Specialized Techniques, Views Are Used, As Illustrated By Diagram[ ].
Mammographs: Fibroglandular Differentiation
Mammograph: Mastitis With Reactive Lymph Node
Ultrasonographically Guided Cyst Aspiration

Ultrasonographically Guided Pre-Surgical Needle Localization: FNACs Access
Sites for Sterotactic Perilesional FNACs

"FIGURE"
(DIAGRAMS)

Sites for Sterotactic Perilesional FNACs
Breast Lesion Biopsy Sites

Pectoralis-Fascia, Muscles Etc.

‘Breast Lesion’ Biopsy Sites

Sites For Perpendicular Directions

MRI Guided Wire Localization & Biopsy

Sites For Suggestive Dimensions

Established Significant Sensitivity Of M

RI For Breast Carcinoma, Benign Breast Lesions Detection, Rendered Comparative Advantageous Status, As Better
‘Radio-Diagnostic Tool’, For Preoperative Wire Localization, Image Guided Percutaneous Core Biopsy, By Using Prototype Biopsy Devices, Free Hand Methods Etc., Had Been Reported Since Mid 90s.


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**Preoperative Needle Wire Localization With Magnetic Resonance Imaging (MRI)**

**MRI Guided Wire Localization & Biopsy:**
Several Prototypes Developed Over Years Including Non-ferrous, Non-magnetic Needles, Vacuum Assisted MRI Guided Core Biopsies. Future Innovations Including New MRI Compatible Contrast Agents e.g. Antibody-specific, Non-ionic Gadolinum Etc.

**Advantages:** Effective Differentiation Of Malignant & Or Benign Nature, Precision For Discrete Tumor Margins Localizations & Hence Ensuring Complete Necessary Tumor Removal, By FNACs, Localization GuideLines, And Thus Overall Treatment Success Rate And Decreased Recurrences. Besides Availability Of Gradually Successful, Minimal Invasive Procedures E.g. MRI Guided Tumor Ablation, MRI Guided Lumpectomies Etc.

**Recent Technologies:**
Include, Positron Emission Tomography (PET) With Fuctodeoxyglucose (FDG) Enhancement, Nuclear Medicine Application, Technetium Tc99m Sestamibi Scintigraphy Tc99m Tetrofosmin Scintigraphy, Computer Aided Diagnosis (CAD), With Role
As Simultaneous ‘Therapeutic Tool’.

‘Results’

In Cases Of Complete Tumor Resection, Rendered Possible Using Available Clinico-Stero-Tactic Guided FNACs Techniques, With Biopsy Proved Tumor Free Resected Margins, No Or Minimal Recurrences (Loco-Regional, Systemic Etc.) & Differing Complications, Were Observed.

Mastectomy & Axillary Clearance Extents,? Tissue Dissection Levels, With Post-Operative Various Different Available Chemo-Therapy Dosage Schedules & Surgical Hormonal (Ovarian) Ablation Methods Have SucessFully Demonstrated OverAll Comparable Quantity, Quality Life.

Especially In Carcinoma Cases, Patients Were Able To Be Managed By Chemo-Endocrinal Supportive Measures, In Non-Compliance & Or Non-Availability Of Appropriate Radio-Therapy Regime Modalities, Namely External Beam R.T; Post Mastectomy Radiotherapy (PMRT) (46 to 50 Gy), Boost Dose (Tumor Bed):(10 to 25 Gy). Tangential Beams, Intrinsic Brachy therapy (Iridium 192), Electron Beams (Linear Accelerators), Photons (Cobalt/Linear Accelerators), Positron Emission Therapy (PET) Etc.

BCT Without Radiotherapy: Several Conducted Trials; Significant High Loco-Regional Recurrences, But no change in overall Survivals.

While Variable Extents, Of Neo - Adjuvant & Adjuvant Systemic Therapy, Including, Chemotherapy (Various Regimes, New Agents, Hormonal Therapy with / without ovarian ablation, Combined Chemo-endocrine Therapy etc., As Needed Were Administered, Monitored By Various Available ParaMetres Of Disease Control.

ReAffirmed The Scientific & Statitical Logistics, Of Better OverAll Treatment Result OutCome, By Retaining The Basic Essential Component Of Breast Preservation Surgery Objective Of, Eradicating Microscopic Residual Disease., At Primary Tumor Level & Control of Ductal System Disease Spread, As Needed.

Per-Operative Clinical Judgement Expertise, For Surgical-Pathology Gross Morphology Appearance & Consistency Etc., To Ensure Adequate Tumor Resection Appropriately, Retained Its Significance As The Most Important Determinant For OverAll Result OutCome With Regards To Various ParaMetres Of Complications, Differing Recurrences Variants, SuccessFul BCT Component Regimes, Survival Rates With Life Quality Etc.

‘Conclusion’

“Acceptance Of BCT, In India”, Have Been Undermined Because Of, Low Incidence of BCS, Due to, Low Proportion of Early Breast Cancer cases (Lack Of Awareness, Early Detection Methodology Compliance Etc.).
However, for low acceptance rate, other causes include,
1. Belief that, preservation surgery results in less disease control, & hence poor overall result out come,
2. High cost of treatment, due to addition of extrinsic R.T. Brachytherapy, with side effects of radio-therapy,
3. Lack of awareness in medical fraternity, in regard for choice of practically available successful treatment modalities.

Modified radical mastectomy (MRM), Mastectomy with easeably permissible axillary clearance, with subsequent needed supportive therapies, retains its gold standard with most of Indian surgeons.
While breast conservation surgery is on global acceptance horizon, especially for, stage I & II disease.

Appropriately removed breast tumor with adequate excision of surrounding normal breast tissue, in consideration of breast tumor ratio (B/T Ratio), being the basic landmark factor for ‘success rate’ of, ‘breast conservation surgery’ & subsequent ‘breast conservation therapy’. The scientific & statistical logistics factual support, in different horizons, was authentically demonstrable in the present study, conducted randomly at different places, in the available limited resources circumstances, in regards to proper pre-operative USG & or mammography access of tumor margins, supported by discrete pre & per-operative clinical acumen guide lines, and consecutive biopsy reports of malignancy free resected.

Present study is an attempt towards better over-all success rate, by pre-operative identification determination techniques, for extent of breast tumor tissue resection (BCS) to avoid loco-regional recurrences, complications & or minimizing the needs of supportive adjunct therapies (BCT), to acceptable optimal levels, thus providing better quantity & quality life expectancies.

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‘Reference’


