

Breast Cancer and Treatment

乳腺癌與治療

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Outline 大綱

- Introduction to Radiation Oncology
- 放射腫瘤學概論
- Use of Radiation Therapy in Breast Cancer
- 使用放射治療乳腺癌
- Breast Cancer Trials
- 乳腺癌試驗

Introduction to Radiation Oncology

放射腫瘤學概論

U.S. Cancer Statistics

美國癌症統計

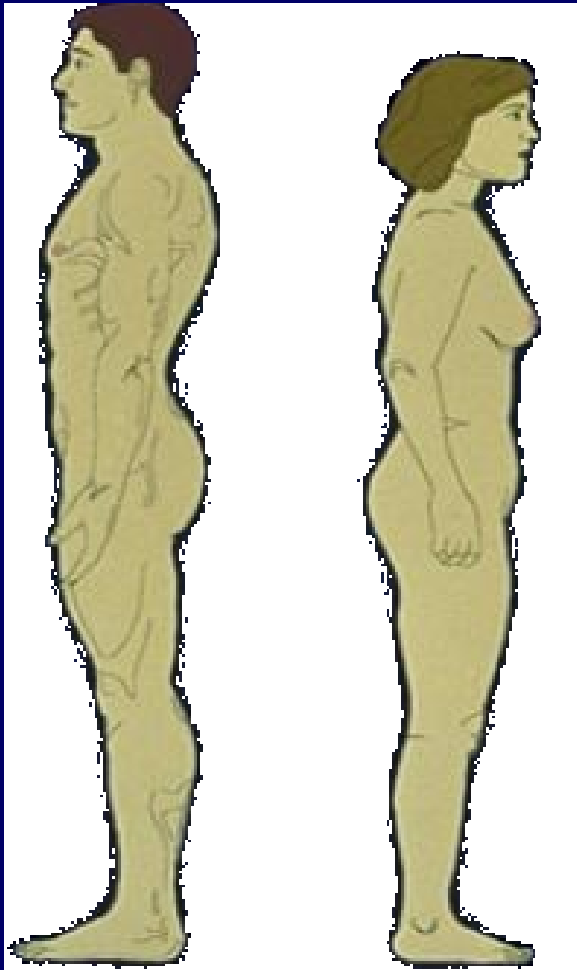
- 140萬新病例的侵略性癌症/年
- 900,000 nonmelanomatous 皮膚癌
- 70%的病入的癌症部位得以确诊, 30% 癌症轉移
- 60%患有侵襲性癌接受X射線治療

» American Cancer Society

•估計新的癌症病例

•10 Leading Sites, 按性別, 美國

- 前列腺 •33%
- Lung & bronchus •14%
- Colon & rectum •11%
- Urinary bladder •6%
- Melanoma of skin •4%
- Non-Hodgkin's lymphoma •4%
- Kidney •3%
- Oral cavity •3%
- Leukemia •3%
- Pancreas •2%
- All other sites •17%



- 32% 乳腺癌
- 12% Lung & bronchus
- 11% Colon & rectum
- 6% Uterine corpus
- 4% Ovary
- 4% Non-Hodgkin's lymphoma
- 3% Melanoma of skin
- 3% Thyroid
- 2% Pancreas
- 2% Urinary bladder
- 20% All other sites

•*Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.

得癌症概率

	男	女
所有癌症	43% (1 in 2)	38% (1 in 3)
乳腺癌		13% (1 in 8)
前列腺	17% (1 in 6)	
結腸 / 直腸癌	5.9% (1 in 17)	5.6% (1 in 18)

腫瘤學學科

- 外科手術
 - General, Specialist
- 醫學腫瘤科
- 放射腫瘤學
- 放射診斷科
- 病理學

治療方案

- 局部治疗
- 手術
 - 放射治疗
- 全身治疗
- 化療
 - 激素治疗

什麼是放射治療？

- 其中一個主要的治療方法，在癌症治療（治療）
- 臨床學科的科學和人類醫學
 - 解決治療和預防癌症
 - 單獨利用電離輻射或與其他治療方法

電離輻射損傷

- 作用在分子水平上
- 損害癌症的 DNA
- 通過直接與 DNA 電離
 - 間接通過形成自由基（電離水）
 - 損害: 通過單鏈 DNA 斷裂，雙鏈斷裂，基礎傷害，DNA - 蛋白質交聯或組合

換句話說

- Use high energy X-rays (typically to treat cancers and non-malignant diseases)
- 使用高能量X射線（通常是治療癌症和非惡性疾病）

放疗的歷史

- X射線轟擊表面在真空產生的高速電子
- 1896, X光機正式展出由H.史密斯
- 娛樂行業的接管，馬戲團顧客支付查看自己的骨骼和雙手戴首飾

放疗的历史

- 1899, 1st 放射治療,在此之前只有手術治療癌症
- 到19世紀結束，放射治療用於痣，痤瘡，紅斑狼瘡，濕疹，乳房胸部復發
- 由early 1900s，更多的惡性淋巴瘤的治療，其中包括食道癌

放疗的历史

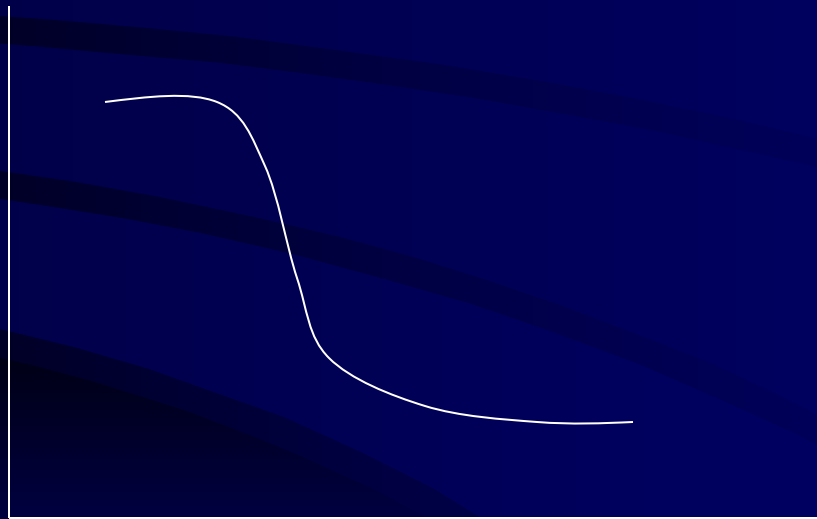
- 1896年 2例乳腺癌治療在芝加哥
- 1896年 4yr old treated with RT for cancer in Vienna and followed for 70 years
- 1903 第一成功治療利用鐳放射治療記錄在聖彼得堡
- 1922 年, 放射腫瘤學形成
- 20世紀初 上半場 , 工程接管 , 以提供更高穿透 X射線

放射治療進展

- 20世紀 40年代之前，主要是治療的患者
千伏X光機或放射源，有限的滲透性，重
要的皮膚反應
- X光機，可以產生光束為 1MV 被稱為兆
伏級機

生存曲線的作用劑量

- 生存曲線



• 劑量

Therefore...

- In order to kill cancers deep in the body, a larger amount of dose would need to be distributed to the outer, more superficial structures
- I.E. Prostate cancer

放射治療適應症

- 通用和姑息治療 Definitive and palliative treatment
- 優勢
 - organ conservation (breast, prostate,bladder)
 - less invasive
 - outpatient
 - decrease surgical morbidities
 - non-surgical candidates

- 缺點

- 漫長的治療過程
- 輻射關聯 morbidities
- 交通運輸
- contraindications
- given only once a one site

放射腫瘤學目標

- 提供精確劑量
- 消除腫瘤的同時最大限度地減少損害正常結構
- 幫助維持較高的生活質量，通過保存器官功能和解剖的完整性

治療序列

- 術前 減少腫瘤負荷
 - sterilize surgical fields/ nodes
 - 轉換不可操作的可操作性腫瘤
 - 保留功能（直腸）
- 与手术并行
- 肿瘤有争议的边界区
- 增加劑量，同時盡量減少發病率

- 術後
 - 侵害性病理解結果
 - 降低復發率
 - 腫瘤有争议的边界区
- 單獨使用通用放射治療
- 同步化療
 - 器官 sparing
 - aggressive tumors

放射治療類型

- Teletherapy 遠距離治療
- Brachytherapy 近距離治療
 - Prostate 前列腺
 - breast
 - Sarcoma 肉瘤
 - Cardiac 心臟
- 有針對性的治療
 - 放射免疫療法
 - 放射性同位素

Treatments

- 周一到周五 5-20分鐘
- 5-7周
- Imaging of port films taken regularly
- Weekly MD visit for skin reaction
- Electrons/ high energy x-rays

Use of Radiation Therapy in Breast Cancer

使用放射治療乳腺癌

Anatomy 解剖

- 乳腺位於
- 對胸大肌
 - 範圍從 2 至第 6 肋骨
 - 從胸骨到腋窩
- 由脂肪，管道，肺葉分為小葉，纖維組織緻密
- 乳房組織表面上是籠罩在胸鰭淺筋膜和深刻的胸深筋膜，
- 在更年期，纖維組織較軟

Anatomy

- 淋巴管
 - drain to 腋窩淋巴結之間的第二和第三肋間
通過胸大肌的鎖骨上窩
 - 通過乳房內部肋間和胸大肌，接近胸骨

流行病學

- 在西方主要國家的問題
- 每年20萬例的案件
- 45,000 每年 死亡率
- 一生中 $1 / 8$ 概率
- #1 nonskin癌症 in 美國
- #2 癌症有關的死亡在美國
- 32%的女性癌症
- 19%的癌症死亡婦女
- Leading cancer related death is US among women 2-59 yrs of age

風險

- 年齡
- 家族史 (1st degree relatives)
- Self history (breast, Hodgkin's Disease)
- BRCA1 or 2 genotype
- 未產婦
- 月經初潮早/ 晚絕經
- 生第一兒童在30 后
- 飲食，激素，環境
- 75%的患者無危險因素
- ADH/LCIS, 9x risk

有家族史 的風險 > 4

- Age
- 出生地點（北美或北歐）
- 絕經前血胰島素樣生長因子（IGF）-1水平升高
- 絕經後血液中雌激素水平升高
- 母親和一個姐妹有乳腺癌歷史

相關的因素，相對風險 2-4

- High socioeconomic status
- 年齡在第一足月妊娠 >30 years
- 一個乳房癌歷史
- 任何直系親屬的乳腺癌史
- 良性增生性病變，乳腺增生的變化，以及高劑量的電離輻射到胸部的歷史

有關因素相對風險 1.1-1.9

- Nulliparity
- 月經初潮早 (age <11 y)
- 絕經期晚 (age >55 y)
- 絕經後肥胖
- 高脂肪的飲食 /飽和脂肪豐富的飲食
- 居住在城市地區，美國北部
- 白色人種 - > than 45 years
- 黑色人種 - < than 45 years
- 子宮內膜或卵巢癌 歷史

Identified factors with a protective role against breast cancer

確定的因素有保護作用，防止乳腺癌

- 初潮年齡 >15 years
- 母乳喂養時間超過 1年
- 不飽和脂肪酸豐富的飲食
- 體力活動
- 絕經前肥胖？

Benefits to Screening

- 每年乳房X線照片檢查
- Older studies (Health Insurance Plan New York (1963-1968)/Swedish Study (began 1977) show 30% decrease in mortality in five years, greatest benefit in women over 50
- National Breast Cancer Screening Study of Canada (1980-1985), no evidence mammograms of benefit for women 40-49yrs (1st 7 years) controversial, design criticized

Breast Cancer Detection Project

乳腺癌檢測

- 1972-1981
- Mammogram and physical exam
- 40% cancers detected mammograms alone
- 10% by PE alone (not seen on mammograms)
- 50% detected by both
- 顯然是有很大的改善成像技術在過去二十年

Detection 乳腺癌檢測

- Not all seen or felt
- Many diagnosed while small in breast
- Believed screening mammograms translated to 25% improvement in breast cancer mortality rate
- Recommendations:
 - 每月的自我檢查 (access for changes, 80% felt on self exam are benign)
 - 年度體檢
 - 年度乳房X光照片後，40歲
 - Baseline (35-40) or depending on FH

Clinical Findings 臨床結果

- Many are detected now through screening
- Some still present with symptoms

- 惡性

- Hard
- Irregular
- Painless
- Bloody discharge
- Fixed
- Skin dimpling
- Nipple Retraction

- Benign 良性

- Firm rubbery
- Regular
- Painful
- No bloody discharge
- Not fixed
- No dimpling
- No retraction

Histology

- 乳腺癌的類型
- 80%的入侵，20%的原位
源於線槽（多數）
或葉
- 浸潤性導管，乳腺導管內（原位癌），
侵襲性小葉，原位小葉很少炎症
invasive ductal, in situ ductal (DCIS), invasive
lobular, in situ lobular (LCIS)
– rarely inflammatory

Treatment Options 治療方案

- 大多數婦女今天有幾種治療選擇, but depends on Stage
- 治療是局部和全身
 - local is addressing the breast itself (surgery, radiation)
 - systemic is addressing entire body (chemotherapy, hormones)

Local Treatment 局部治療

- 兩個主要的選擇對大多數婦女
- Equivalent survival 等效生存率
- 乳房切除或腫塊切除術與輻射 (Breast Conservation Therapy)
- 大小，類型和位置影響選擇

Consultations

- Surgeon 外科醫生
- Medical Oncologist
- Radiation Oncologist 放射腫瘤學家
- Radiologist
- Pathologist

乳房切除 Vs. BCT

- Factors to consider:
- 個人選擇
- Cosmesis
- Convenience
- Co-Morbidities
- Complications from each
- 有時輻射乳房切除後無論如何是需要

Lymph Node Sampling 淋巴結採樣

- Standard for invasive disease
- 乳腺癌腋窩淋巴結是主要排洩
- 傳統上，腋窩淋巴結採樣
- 前哨淋巴結活檢 (most women)
 - unless large lymph nodes under arm
 - large tumor
 - poor features

Prognostic Features 預後特點

- 淋巴結狀態（規模，數量，囊外參與）
Imaging studies if needed (CT scans, Bone scans, CXR)
- 腫瘤大小
- Tumor grade 腫瘤分級
- Hormonal status 激素狀態
- Extent of Spread 蔓延程度

Breast Conservation Therapy

保乳治療

- Lumpectomy with clean margins
- treats typically 整個乳房
- 大約 4週後手術或化療後
- M-F 5-7 weeks
- better cosmetic result
- 類似的生存率=乳房切除術

Early Breast Trials 早期乳腺癌試驗

- Mainly involved “more conservation” surgery (lumpectomy, quadrantectomy, simple mastectomy, with lymph node dissection) Vs. radical mastectomy and modified radical mastectomy
- Major International Studies
 - Milan Trial, NSABP-04/06, NCI, Institut Gustave-Roussy, EORTC, Danish Trial

Milan Trial *

- Prospective randomized trial, 701 women
- 2 arms
 - quadrantectomy with axillary lymph node dissection plus XRT (50 Gy breast plus 10 Gy boost to tumor bed)
 - Vs. radical mastectomy
 - all women with +LNs underwent 12 cycles CMF chemotherapy

Milan- Results

@ 8yrs	OS	DFS	LF
BCT	83%	77%	4.8%
Radical Mastectomy	85%	80%	2.3%

NSABP-06

- 1581 pts 1976-84, Stages I-II
- < 4cm tumor, 62% LN-, 26% 1-3nodes, 12% 4+ nodes, ER available data in 75% women (64%+), + surgical margins 10% with lumpectomy
- All with ALND
- RT 50Gy no boost
- LN+ melphalan + 5FU
- Total mastectomy vs lumpectomy vs lumpectomy +RT

NSABP-06 Results

- At 12 years, no difference in survival in 3 arms, but meta-analysis of large trials show survival benefit with XRT Vs.

Lumpectomy alone

- However, 40% local recurrence in lumpectomy alone arm
- LR with XRT 5-10% (LN+ at 5%, received chemo also)

20 year update

- NEJM 2002, Oct 17;347(16):1233-41
- 73% ，復發 1 5年之內 ， 18%在5至10年 ， 8% ， 10年後
- No difference in OS survival in 3 groups at 20 years
- Unpublished, node – subgroup with survival advantage

Without RT for older women

- Intergroup (CALGB 9343, RTOG 97-02, ECOG) 2004 (94-99)
- NEJM 2204;Sept 2;35(10):971-7
- 70 years or older, T1N0, ER+
- 636 pts randomized tamoxifen +/-RT
- 5 yr LRF 4% vs 1% favoring RT
- No diff 5yr OS (87%/86%)

- Princess Margaret Study 1992-2000
- 50 yrs + (ave 68yrs)
- NEJM 2004 Sept 2;351(10):963-70
- 5 yr LR 7.7% vs 0.6%, DFS 84% vs 91%
- No diff DM or OS

Tumor Boost Trials

- EORTC 22881/10882 (1989-96)
- NEJM 2001 Nov9;345(19):1378-87
- Stage I-II
- 50Gy/25 Fx +/- 16Gy boost
- Boost was lumpectomy plus 1.5cm
- 5yr LR 4.3% vs 7.3% (40% reduction)
- Most benefit younger pts (10.2% vs. 19.5%)
- No diff OS

Breast RT on Survival

- Early Breast Cancer Trialists' Collaborative Group
- Lancet 2000 May 20;335(9217):1757-70
- Meta-Analysis of 40 trials
- 10 and 20 year results looking at cause specific mortality (1/2 were LN+)
- RT associated with 2/3 reduction in LR (8.8% vs 27.2% at 10years)
- Breast Cancer Mortality Reduced but increase other mortality (cardiac)
- Criticism: older RT techniques

- Van de Steene 2000
- “Adjuvant radiotherapy for breast cancer significantly improves overall survival: the missing link.”
- Radiother Oncol 2000 June;55(3):263-72
- Analysis of Early Breast Cancer Trialists’ Collaborative Group study showed survival benefit (12% reduction) for recent trials using standard fractionation.

Contraindications to Breast Preservation

禁忌保乳治療

- Absolute contraindications to lumpectomy/RT
 - Pregnancy 妊娠
 - 已放疗过乳房
 - 兩個或兩個以上的癌症總灶在不同的象限同乳腺癌
 - X線結果暗示暗示瀰漫地區惡性腫瘤
 - Failure to obtain negative margins despite several surgical attempts

- Relative contraindications to lumpectomy/RT
 - Tumors larger than 5 cm
 - Very small breasts
 - Collagen Vascular Disease
 - Extensive DCIS

輻射對局部晚期乳腺癌

- T3/T4
- postop, usually follows chemo
- chest wall XRT plus LN XRT
- Studies shown LC and OS benefit
 - Ragaz (BC 318pts, Stages I-II, +LN, 17% benefit DFS premenopausal),
 - Fowble (identified risk factors for LR)

Indications postoperative XRT

- Diffuse multifocal disease
- T3/T4
- close or positive surgical margins
- positive LN, premenopausal
- >4 LNs all pts, extracapsular extension of LN, >2cm +LN, pectoral fascial involvement (Fowble's data from ECOG studies showed >7LNs less benefit from XRT secondary to DM)

Danish Breast Cancer Cooperative Group*

- 1708 pts
- s/p mastectomy for pathological stage II-III
- prospectively randomized
 - 8 cycles CMF plus chest wall and LN XRT
 - Vs. cycles CMF
- median F/U 114 months

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*Overgaard, M. NEJM 1997; 337: 949-955

Danish Study- Results

@ 10 yrs	LR +/- DM	OS
CMF alone p<0.001	32%	45%
CMF + XRT p<0.001	9%	54%

Canadian Adjuvant RT Trial

- 318 pts , node +, premenopausal women
- Mastectomy >> CMF (cyclo 600mg/m², metho 40mg/m², 5FU 600mg/m² IV q 21 days)
- RT 37.50 Gy chest wall and lymphatics
- 15 yrs , reduce LR 33%, reduce breast cancer mortality 29%
- DFS 60% RT, 44% no RT
- OS 68% RT, 58% no RT

Systemic Treatment 全身治療

- 化療
- Hormones 激素
- 取決於幾個因素
 - 淋巴結狀態
 - 絕經狀態
 - 激素受體狀態
 - 病人情況
 - 其他的病理特徵

Sequence of Treatment 治療序列

- Surgery>Chemotherapy>XRT>Hormones
- Surgery>XRT>Hormones
- Surgery>XRT
- Surgery (Mastectomy, good prognostic features)
- Surgery>Systemic Treatment
- Neoadjuvant Chemo>Surgery>XRT

Sequencing Chemo and RT

- Joint Center Trial
- NEJM '96 May 23
- 244 pts Stages I-II
- High risk, +LN or -ER, +lymph vasc
- Chemo>>RT or RT>>Chemo
- Chemo 4 cycles (12 weeks)
metho,leucovorin,cyclo,pred,doxo

5 yr 精算結果

	Recurrence any site	DM	OS
RT first	38%	36%	73%
Chemo first	31%	25%	81%

5 yr. crude 1st recurrence

		LR	DM
RT first		5	32
Chemo first		14	20

Conclusions 結論

- 低風險的病人 可以放射治療的第一
- 高危患者應得先化療
- If RT starts within 50 days of surgery, LR 2%, if longer LR 6%
- **HOWEVER**, updated data JCO 2005 ;23(9):1934-40 shows no difference in time to any event, metastases or death

NSABP-17*

- BCT is also an alternative for patients with DCIS
- In situ studies have also shown no difference in survival between BCT and mastectomy
- NSABP 17, 391 pts
- 2 arms, lumpectomy alone Vs. lumpectomy+XRT

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* Fisher,B.NEJM 1993;328:1581-1586

NSABP 17 Results

@8yrs	Noninvasive IBT	Invasive IBT
Lumpectomy alone	13.4%	13.4%
With XRT (50Gy)	8.2 %	3.9%

Current DCIS Studies

- NSABP 21
 - occult disease <1cm
 - BCT +Tam, BCT + placebo, lumpectomy alone
 - involves Tamoxifen in 2 arms (as large NSABP 24 DCIS study, 1804 pts, showed positive benefit with Tamoxifen after BCT , decrease 13.4% to 8.2% IBT, 3.4% to 2% contralateral at 5yrs).

Van Nuys Prognostic Index

- GENERAL guidelines to help determine patients who are candidates for breast preservation and whether they need adjuvant RT
- Four significant predictors of local recurrence: overall tumor size [largest single-direction size measure], closest clear surgical margin width [thinnest width], pathologic nuclear grade classification, and patient age. Scores of 1 (best) to 3 (worst) are assigned for each of the 4 predictor parameters and then summed/totalled to give an overall **VNPI score** ranging from 4 to 12

General Guidelines 一般準則

- Age
 - 61 or older... 1pt
 - 40-60... 2pts
 - <40... 3pts
- Surgical Margin
 - 1cm or more... 1pt
 - 1mm-9mm... 2pts
 - <1mm... 3pts
- Grade
 - Nuclear grade 1,2,3
- Size
 - 1.5mm or less... 1 pt
 - 1.6-4mm... 2pts
 - 4.1mm or greater... 3pts

Breast Brachytherapy

乳腺癌近距放射治療

- Criteria 標準

- 階段 0,I,II <3cm

- DCIS or invasive adeno 原位癌或腺病毒入侵

- Clear margins 邊緣清晰

- No multicentric disease 沒有多中心

- 3 or less nodes per NSABP39

- No extracapsular nodal extension even microscopic

- No paget's

Breast Brachytherapy

- Rationale 理由：
 - Only 10-40% pts who are candidates for BCT receive it across country
 - Transportation/time issues
 - 大多數在乳房腫瘤切除術腔復發 Veronesi et al *. 20 yr 在同側乳腺出腔一樣對側乳房發生，類似的調查結果 in Yale group**
 - 避免副作用外照射

» * Veronesi et al. *N Engl J Med* 347:1227-1232, 2003

» **Smith TE et al. *Int J Radiat Oncol Biol Phys* 48:1281-1289, 2000

Data

- Many mature phase I-II trials, 5 yr data with LC comparable to WBI
- Interstitial Data-
 - Vicini '93 pilot trial LDR brachytherapy, 120 pts enrolled by '01 5 yr f/u, median 82 months, 0.9% recurrence
 - Second trial with HDR 70 pts, combined data * 5yr actuarial recurrence 1.2%
- Mammosite- user friendly catheter
 - Over 2000 cases now
 - Preliminary single institution evaluation –good cosmesis and LC

» Vicini et al. *J Surg Oncol* 70:33-40, 99.

» Vicini et al, *Int J Radiat Oncol Biol Phys* 57:1247-1253, 2003

APBI > 5 Yr Follow up

Institution	# Cases	Median F/U (mo)	5-Yr Actuarial Recurrence Rate Total (%)	5-Yr Elsewhere Failure Rate (%)	Cosmesis Good/Excellent
WBH	199 LDR 120/HDR 79	96	1.6	0.8	92
Tufts/Brown U	33	82	9	9	88
RTOG 95-17	99		4	2	
HDR	66	78	3	2	--
LDR	34	85	6	3	--
NIO, Hungary Phase I/II Trial	45	80	6.7 ^a	6.7 ^a	84
NIO, Hungary Phase III Trial	127	66	4.7	3.1	81
Ochsner Clinic	164	65	3	0	75
TOTAL	667	65-96	maj. <5	maj. <5	maj. >80

NSABP 39 Trial

- Title: A Randomized Phase III Study of Conventional Whole Breast
- Irradiation (WBI) Versus Partial Breast Irradiation (PBI) for Women with Stage 0, I, or II Breast Cancer
- Anticipated 4300 women enrolled by 2011.
- Currently >3000 women enrolled

Group 1

Standard Treatment

Whole Breast Irradiation (WBI)

Chemotherapy, if needed

Followed by

Whole Breast Irradiation

(1 treatment a day, 5 days a week for 5-7 weeks)

Group 2

Test Treatment

Partial Breast Irradiation (PBI)

Multi-catheter Brachytherapy

or

MammoSite® Balloon Catheter

or

3-D Conformal External Beam
Irradiation

Followed by

Chemotherapy, if needed

Hormonal therapy (only if your tumor has a positive hormone receptor test) will be chosen by your doctor and will continue for at least 5 years. The timing for when the hormonal therapy will begin depends on whether or not you will receive chemotherapy.

Daily Treatments

- Mon-Fri
- approximately 7 weeks
- 1.8-2 Gy/fraction to 50.4 total dose plus boost
- 5-10 min a day
- painless

Hypofractionated

- Canadian/UK trials
- Fewer treatments
- More Convenience
- Side effects/Cure?
- Cosmesis?

Randomized Trial of Breast Irradiation Schedules After Lumpectomy for Women With Lymph Node-Negative Breast Cancer

- Results initially with median follow-up of 69 months (JNCI 2002;94:1143-50)
 - 1234 pts, T1-2 N0 disease, lumpectomy with negative margins, 2 arm randomization
 - 622 received 42.5 Gy in 16 fractions and 612 received 50 Gy in 25 fractions
 - Primary endpoint local recurrence
 - Secondary endpoints were distant recurrence, cosmesis, and late radiation toxicity

Randomized Trial of Breast Irradiation Schedules After Lumpectomy for Women With Lymph Node-Negative Breast Cancer

Table 2. Actuarial rates of local recurrence at 5 years by treatment group according to stratification factors

Variable	Short arm		Long arm	
	No. of patients	5-y local recurrence rate, %	No. of patients	5-y local recurrence rate, %
Age				
<50 y	157	3.6	148	7.2
50–59 y	186	2.9	155	2.6
60–69 y	181	3.1	200	1.0
≥70 y	98	1.0	109	2.9
Tumor size				
≤1 cm	183	1.7	192	1.6
>1–2 cm	317	2.1	302	3.5
>2 cm	122	6.4	118	5.4
Systemic therapy				
No	298	3.0	295	3.9
Yes	324	2.6	317	2.6

Local in-breast recurrence data from original study with 5 year follow-up

Long-term Results of a Randomized Trial of Accelerated Hypofractionated Whole Breast Irradiation Following Breast Conserving Surgery in Women with Node-Negative Breast Cancer

- Median follow-up now 144 months
- Local Recurrence at 10 years
 - 6.2% (hypofrac)
 - 6.7% (standard frac)
- Cosmesis at 10 years (EORTC Rating System)
 - 70% excellent (hypofrac)
 - 71% excellent (standard frac)
- Late mod-severe skin/sub-Q toxicity at 10 years
 - 6% skin & 8% sub-Q (hypofrac)
 - 3% skin & 4% sub-Q (standard frac)

Side Effects 副作用

- Localized 局部
 - Skin 皮膚
 - Fatigue 疲勞
 - Pneumonitis 肺炎
 - secondary ca
 - arm edema 手臂水腫
 - Ribs 肋骨
 - Heart 心臟
 - Cosmesis 美容外观

Treatment Management 治療管理

- Weekly visits 每週訪問
- Antioxidants 抗氧化劑
- skin care 皮膚護理
 - Shaving 剃須
 - Deodorants 除臭劑
 - moisturizers/soaps
 - Chlorine

Survival 存活率

- 依賴於癌症 階段 / 治療 (全身)
 - Stage 0 (DCIS) 97-100%
 - Stage I- approx 80%-85%
 - Stages II-IV
 - depends on LN status, extent of spread, systemic treatment

- 常見的問題有許多相關的風險
- Advancements in treatment less 2 decades
 - More conservation surgery (lumpectomy, sentinel node)
 - Radiation therapy greater role (BCT, Brachytherapy)
- 病人的選擇，需要充分了解
- Curable 可治愈的