

Cutaneous Lymphoma and Radiotherapy

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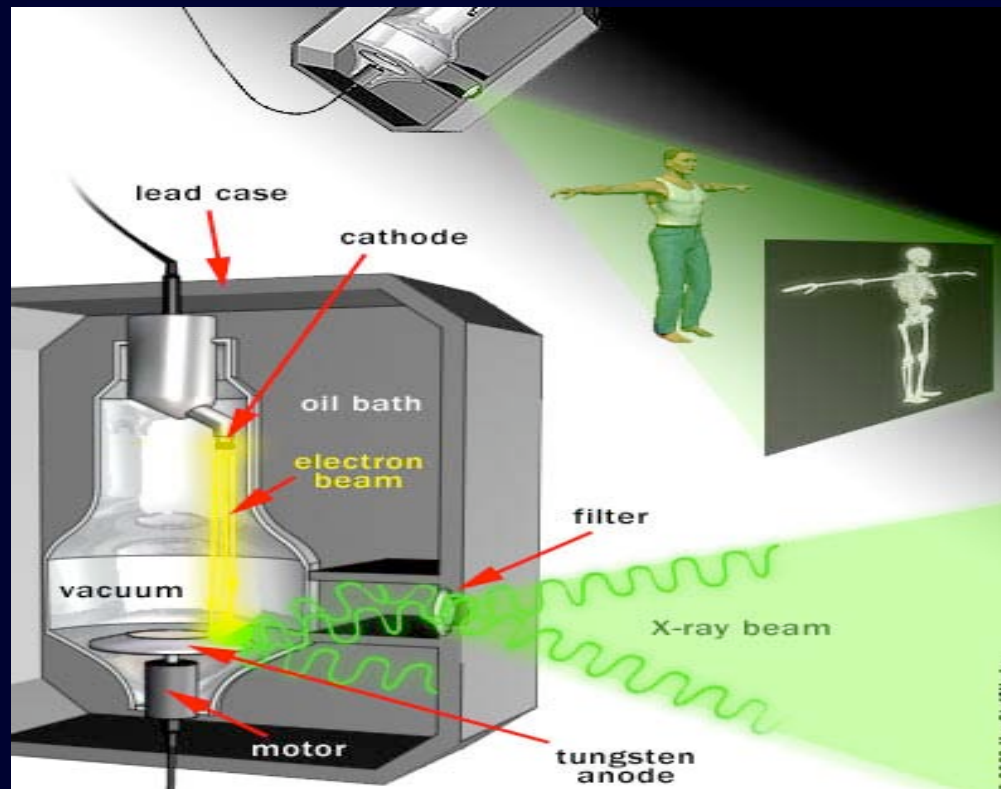
Disclosure

- Ligand speaker honorarium related to
Cutaneous Lymphoma Symposium
Harvard Medical School (2006)

Radiotherapy

- Cutaneous T-cell lymphoma
Various types
- Cutaneous B-cell lymphoma
Various types

Radiation

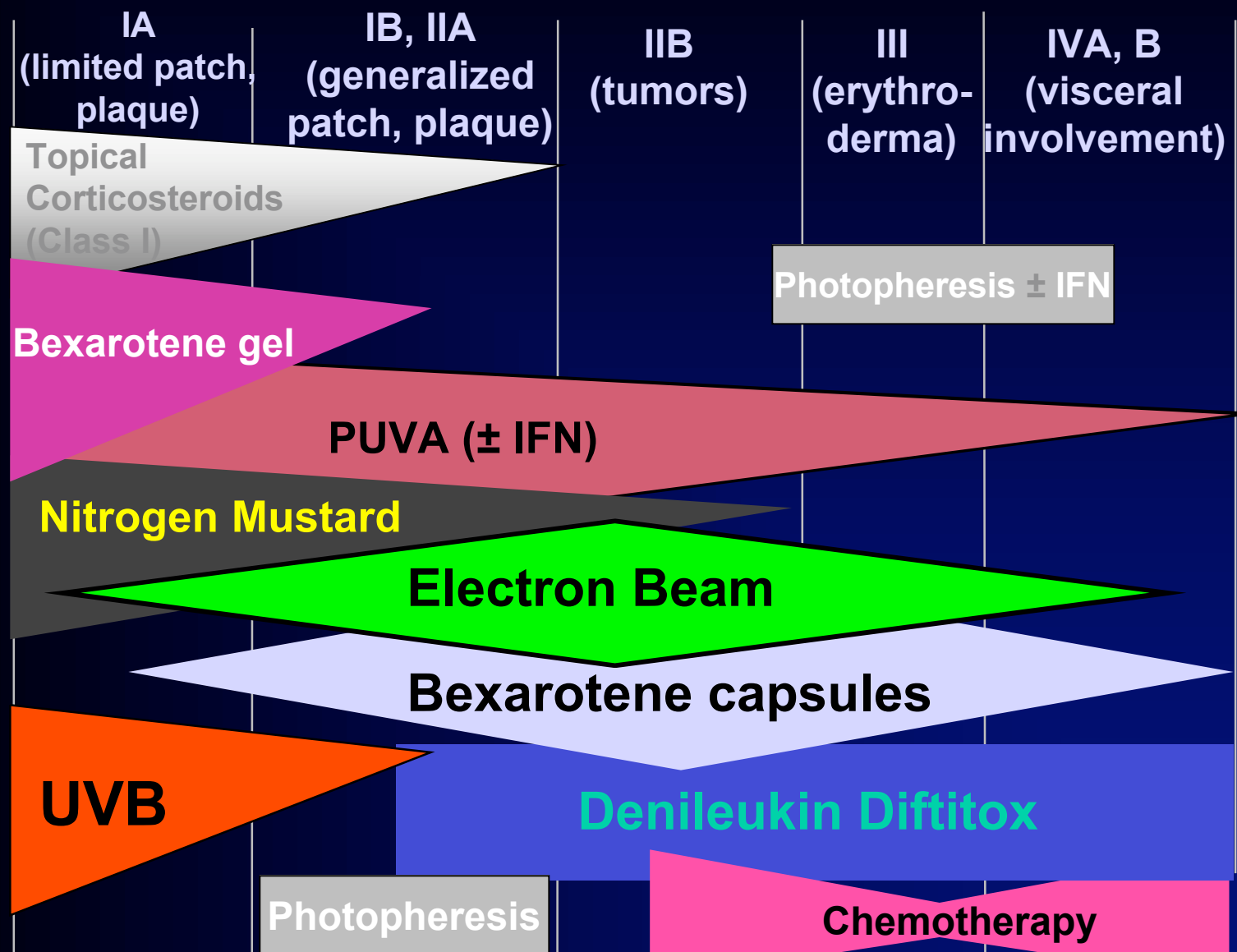


The heart of an X-ray machine is an electrode pair which is the anode and cathode, which sits inside a glass vacuum tube. The cathode is a heated filament, like you might find in an older fluorescent lamp. The machine heats up by passing current through the filament. The heat emits electrons off of the filament surface. A flat disc made of tungsten which is the positively-charged anode draws the electrons across the tube

Radiation for cutaneous lymphoma

- Electrons vs photons=SAME but depends on energy selected!
- If electrons, we use what is called bolus material to make sure the dose on the skin is 100% of what we prescribe
- Radiation delivery is painless!
- Patients are NOT radioactive

MF/SS Treatment Algorithm



Cutaneous T-Cell Lymphoma/MF Therapy

Local EBRT(electrons/photons)

- Superficial 30-125 kvp
- Orthovoltage 125-500 kvp
- Electrons 6-16 MeV
- LINAC for lymphoma inside the body
- Treatment is daily, 5 days per week
- Treatment course 10-20 visits for localized “spot” treatment
- 36 visits/4 d per week/9 weeks TSEBT

Radiation oncology evaluation and treatment design

- Radiation oncologists complete 5 years of residency training following medical school
- Consultation with the patient
(records, pathology, scans are reviewed)
- Simulation
(design the treatment fields/CT scan, include margin, photograph the area)
- Dosimetry and prescription (several days)
- Treatment
(Begin that day if urgent)

Cutaneous T-Cell Lymphoma/MF

Therapy

Local Superficial Radiotherapy in Management of Minimal Stage IA MF.

Wilson et al. IJROBP, 1998

- 21 pts (1954-1996)
- 9 failed prior Rx
- Median F/U 36 mos
- Median dose 20Gy; 17 pts >20Gy
- CR 97%
- DFS 5 & 10 years=75 & 65%
- LC 5 years=75%

Cutaneous T-Cell Lymphoma Therapy

Local Accommodations

Ronald McDonald Home
501 George Street
New Haven, CT 06520
Phone: 203-777-2589 (Lobby)

Mobile available upon request

Yale Center of Human Physics
Yale University School of Medicine
Yale-New Haven Hospital
Health Radiation Therapy Center
15 York Street
New Haven, CT 06524
Phone: 203-688-6444
Fax: 203-783-4622

Clinical Practice Specialist
(Billings Road to see)
Phone: 203-783-2588

Clinical Consultation
Appointment Coordinator
Phone: 203-688-6666
Fax: 203-688-6669



Total Skin
Electron Beam
Therapy (TSEBT)
and Cutaneous
T-cell Lymphoma
(CTCL)



Yale University
School of Medicine



Yale-New Haven Hospital

Cutaneous T-Cell Lymphoma Therapy

TSEBT (Total Skin Electron Beam therapy)

- Technically challenging
- Excellent for those refractory to other Rx
- Excellent rates of control for CTCL/MF
- Trump first reported in 1953
- Stanford technique described in 1960
- 30-40 pts per year at Yale
- LINAC dedicated to TSEBT program 1/2 day

Cutaneous T-Cell Lymphoma/MF Therapy

TSEBT at Yale (single field)

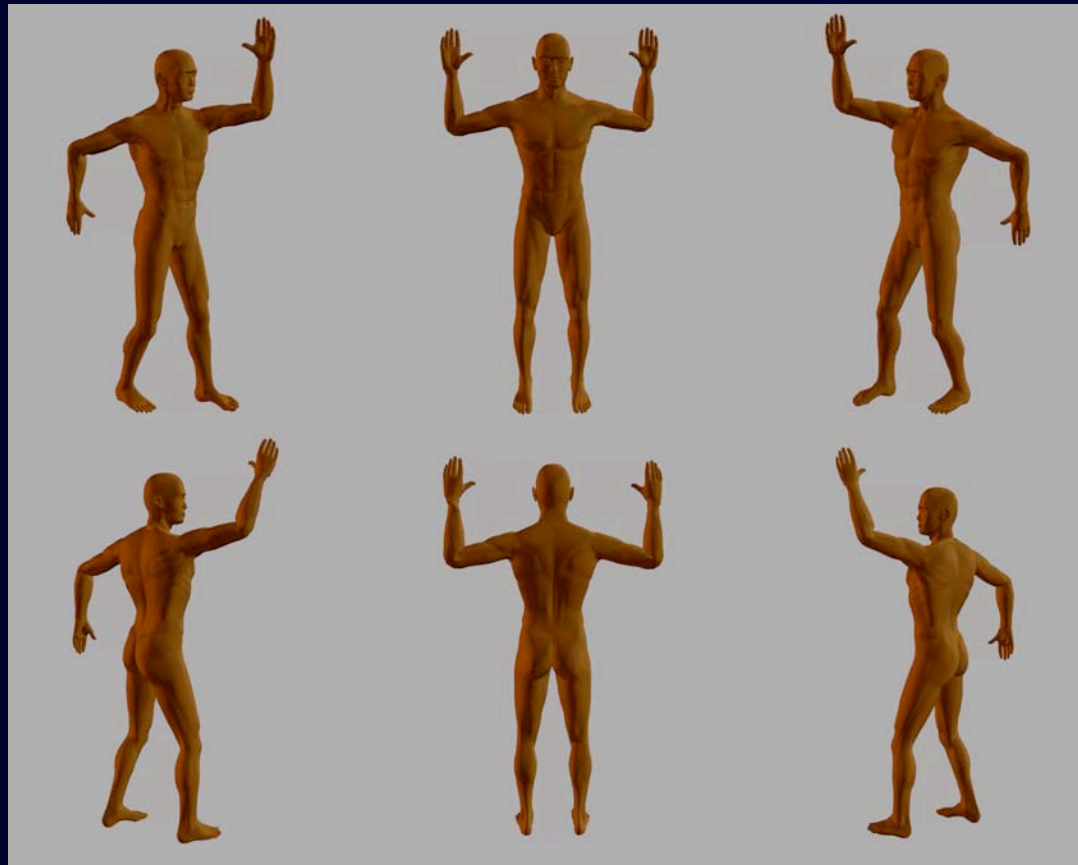
- ✓ 6 MV
- ✓ 7 Meters
- ✓ 6 Fields
- ✓ 3 fields/D, 2 day cycle(1 Gy/D), 4D/WK
- ✓ 36Gy
- ✓ Boosts to perineum/soles/scalp
- ✓ X-ray contamination 0.4%
- ✓ Energy 3.9 MeV at surface

Cutaneous T-Cell Lymphoma/MF Therapy

- 9 weeks, 4 days per week (36 visits)
- Standing position
- Staff sets up all blocking
- Treatment itself is not painful
- Takes less than 20 minutes for each TSEBT session
- Additional time for boosts to the feet and perineum
- No marrow toxicity; counts do NOT need checking
- No gastrointestinal effects
- Wear a paper gown

Cutaneous T-Cell Lymphoma/MF

Therapy



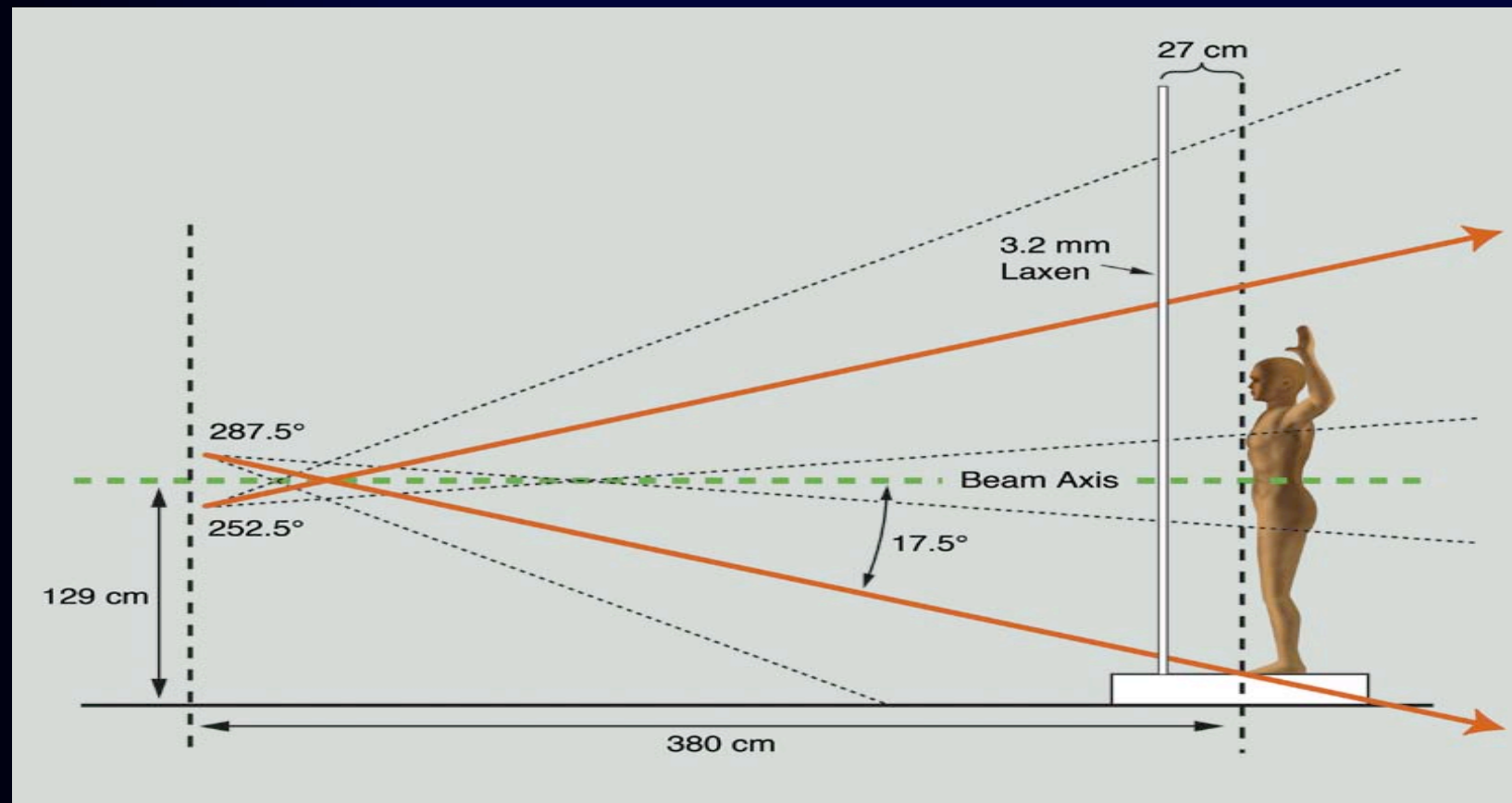
Cutaneous T-Cell Lymphoma/MF Therapy

TSEBT at Yale

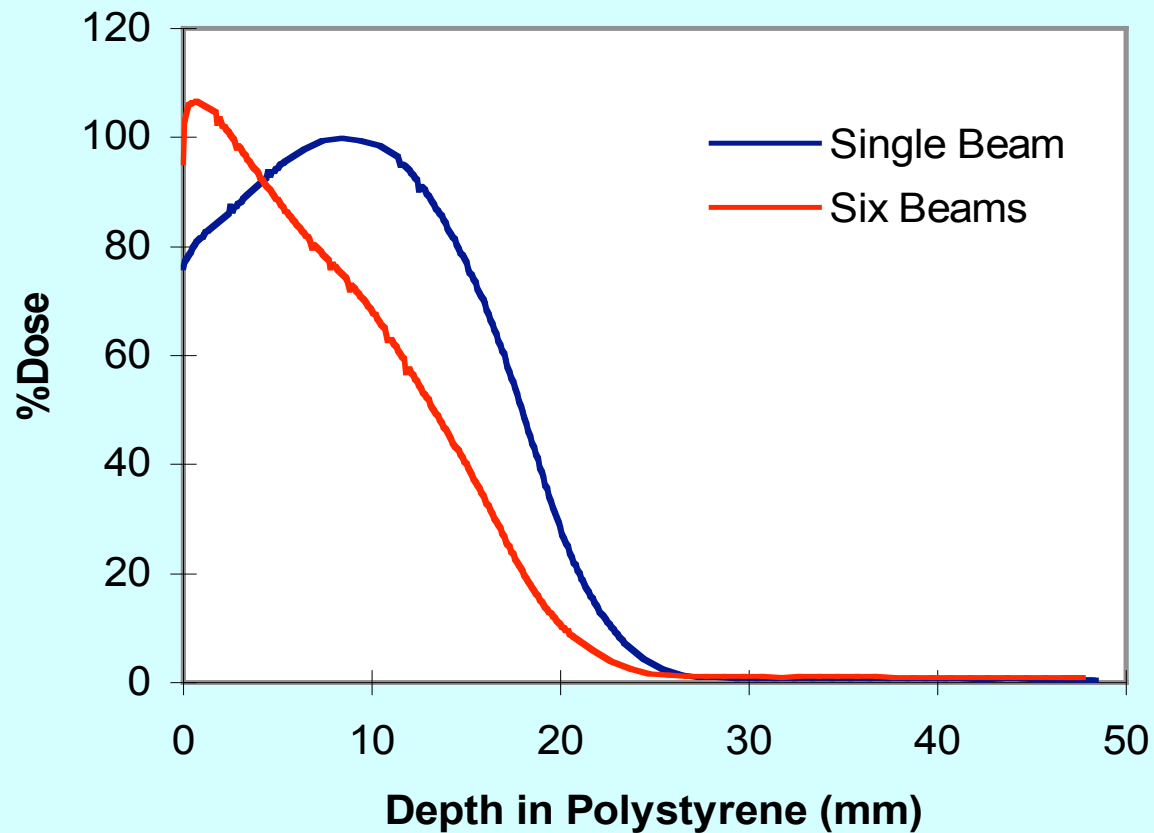
	Dual field	Single Field
Equip	Varian 21EX	Clinac 6
SSD	3.8M	7M
MeV	3.9	3.98
Dmax	0.8cm	0.9cm
X-ray	1.2%	0.4%
D Rate	140 cGy/min	750 cGy/min
Gnt Ang	252.5 & 287.5 ⁰	270 ⁰

Cutaneous T-Cell Lymphoma/MF Therapy

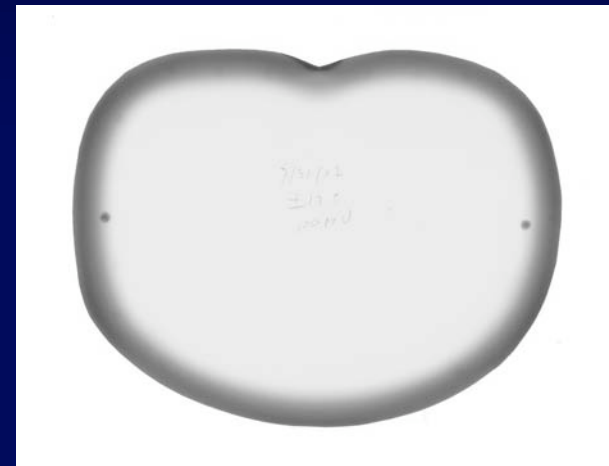
Chen J, Agostinelli A, Wilson L, Nath R. IJROBP 2004



Cutaneous T-Cell Lymphoma/MF Therapy



- Single field versus six fields



Cutaneous T-Cell Lymphoma/MF

Therapy

TSEBT at Yale (Shielding)

- Eyes External shields 22 D
- Eyes Internal 14 D
- Lips First 8 days
- Ears PRN
- H/nail Mitts 18 cyc/nails ALT cycles
- Foot 18 cycles

Cutaneous T-Cell Lymphoma/MF Therapy

TSEBT at Yale (Boosts)

- 120KV x-ray
- Perineum first and final 9 RX
- Soles of Feet first and final 7 days
- 1 Gy/day
- Tumors boosted as needed

Cutaneous T-Cell Lymphoma/MF

Therapy-YALE

CR

T1 97

T2 87

T3 78

T4 60

Cutaneous T-Cell Lymphoma/MF

Therapy

Toxicity-Acute

- Pruritus (itching)
- Epilation (loss of hair)
- Desquamation (loss of skin)
- Hypohydrosis (decreased sweating)
- Xerosis (dry skin)
- Erythema (redness)
- LE Edema (leg swelling)
- Bullae (blisters)
- Onychoptosis (nail deformation and loss)

Cutaneous T-Cell Lymphoma/MF

Therapy

Toxicity-Chronic

- Atrophy/telangiectasia (thinning of skin/small blood vessel appearance)
- Hypohydrosis (decreased sweating)
- Alopecia-(hair loss)
usually temporary
texture change, thinner
- Fibrosis (thickening)
- Second dermatologic malignancy (skin cancer-BCC/SCC)

**Cosmesis Excellent-fractionation

Cutaneous T(MF) and B-Cell Lymphoma

Questions....answers

- Localized therapy with RT?
- Second malignancy related to RX?
- Adjuvant Rx help after TSEBT?
- TSEBT Response rate for T4 disease?
- Can we repeat TSEBT safely and does it work?
- What about adjuvant ECP following TSEBT?
- Role of RT for localized CBCL?

Cutaneous T-Cell Lymphoma/MF

Answers....

Malignant Melanoma and Other second Cutaneous Malignancies in CTCL. The Influence of Additional Therapy After TSEBT.

Licata, Wilson, Braverman, Feldman, Kacinski.
Arch Derm 1995

- 164 patients-TSEBT
- 6 developed MM (12-95) mos following TSEBT-3 had PUVA. No additional RT in those with MM.
- 24 developed 37 BCC and 34 SCC (11 mos-10 yrs) following TSEBT. 15/24 had PUVA, 12 mechloreth, 9 had additional RT.
- Conclusion-PUVA or Mech associated with BCC/SCC, but not melanoma. Additional RT not associated with any second malignancy.

Cutaneous T-Cell Lymphoma/MF

Answers....

Additional courses

Wilson et al. JAAD 1996

Becker/Hoppe /Knox IJROPB 1995

- **Stanford/Yale**
- **Excellent response-nearly to level of first course**
- **Best results with long interval between courses**
- **TSEBT Can be repeated up to 2 times (60-70Gy)**

Cutaneous T-Cell Lymphoma/MF

Answers....

Adjuvant topical

Quiros/Wilson IJROBP 1997

- Adjuvant PUVA improves DFS ($p < 0.018$)
- Stanford reveals similar findings for NM

Cutaneous T-Cell Lymphoma/MF

Answers....

Localized therapy with RT

Wilson et al. IJROBP, 1998

- Excellent results
- 1-4 lesions
- CR rate 95%
- DFS at 5-10 years of 75%

Cutaneous T-Cell Lymphoma/MF

Answers....

TSEBT for T4

Jones/Wilson Cancer 1999

- 45 pts
- All received TSEBT WITHOUT Neoadjuvant, concomitant, or adjuvant RX
- 60% CR, 26% progression free at 5 Years

Cutaneous T-Cell Lymphoma/MF

Answers....

T4 TSEBT and ECP...

Wilson/Jones et al. Am Acad Dermatol 2000

- 44 pts
(23 TSEBT /21-concurrent or adjuvant ECP)
- CR-73%
- ECP improves DFS, PFS and CSS
- CSS ($p < 0.048$ with adjustment for B status and stage)
- DFS ($P < 0.024$ with adjustment as noted)
3 year =49 v. 81%.

Cutaneous B-Cell Lymphoma

- Radiation is extremely beneficial
- Response rates =100%
- Out-patient therapy
- 5 minutes
- Redness of the skin, very mild fatigue
- Redness resolves within 2-3 weeks
- Total of 20 visits
- Electrons or other “superficial” radiotherapy

Radiotherapy for CBCL Yale Series

34 pts met the following criteria:

- Evaluated at Yale prior to definitive therapy
- CT chest/abdomen/pelvis negative
- Primary treatment with radiotherapy (RT)
- Biopsy specimens reviewed by two dermatopathologists
- Classified by both WHO and EORTC

Radiotherapy for CBCL Yale Series

- 34 patients meeting specified criteria
- Radiotherapy dose range 20-40GY
- Median dose 40Gy

Yale CBCL Series: Outcome

	Entire cohort	FCC/ DLB (n=17)	FCC/ Fol (n=8)	MZ/ MZ (n=4)	Leg/ DLB (n=3)
5-year overall survival	96%	100%	100%	100%	67%
5-year relapse-free survival	55%	62%	73%	67%	33%
5-year systemic relapse-free survival	79%	81%	86%	100%	67%

Radiotherapy for CBCL

Conclusions from the Yale series

J Clin Oncol 22:634-639, 2004

- Less than 36Gy revealed increased risk for LR at 5 years of 50% vs. 90% for those receiving ≥ 36 Gy (p=0.05)
- Localized radiotherapy alone is an effective, non toxic regimen with excellent results

Cutaneous B-Cell Lymphoma Radiotherapy

		<u>Pts</u>	<u>Dose</u>	<u>CResp</u>	<u>5-yrRFS</u>
Santucci	1991	83	40	100	<50
Piccinno	1993	31	10-40	100	41(2-yr)
Rijlaarsdam	1996	40	30-40	100	85(2-yr)
Kirova	1999	25	30-40	92	75
Eich	2003	35	27-54	100	50
Piccinno	2003	104	14-35	100	23
Smith	2004	34	20-48	100	55

Cutaneous Lymphoma

In closing...

- Excellent response rates with TSEBT and local RT for both CTCL and CBCL
- TSEBT/local RT meaningful palliative treatment and can alleviate itching, discomfort, ulceration, tumors, patches and plaques
- Multidisciplinary management-**critical**
- Important for TSEBT to be offered at a center with experience in this modality