Issue 29: April 2015

AccuBoost®
for image guided breast irradiation

BOOSTER CLUB NEWSLETTER

CEO'S CORNER

There has been a surge of interest on the part of many facilities to offer the AccuBoost procedure. This issue covers the product launch at a number of recent sites. It reports on Q & A on best industry practices for dose design with AccuBoost, and provides a partial conference participation schedule.

The highlight of this issue is a review of the recent article in the Brachytherapy Journal that describes the rationale and feasibility of AccuBoost as a non-invasive approach to deliver the accelerated partial breast irradiation (APBI) dose.

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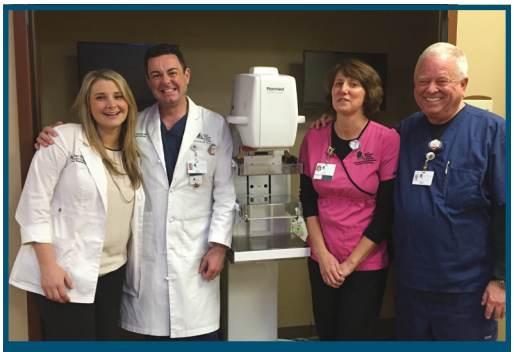
ACCUBOOST EXPANDS TO NEW SITES

The list of AccuBoost sites is steadily increasing. In recent months, AccuBoost has witnessed the launch of the procedure at a number of new facilities. A few of the new installations are featured in this issue:

AccuBoost team at CTCA Southwestern Regional Medical Center in Tulsa, OK, from Left: Amarjit Sen, PhD; physicist; Elesha Odle, RTT; and Judy Cain RTT, Therapists Michael Payne Jr., MD; and William Jones, RT(T) Radiation Oncology Supervisor

Cancer Treatment Centers of America



AccuBoost team at CTCA Southeastern Regional Medical Center in Newnan, GA, from left: Shannon Kinser, CMD; Sean Cavanaugh, MD, Chief of Radiation Oncology; Lori McGuire, RT (R)(M) Mammography/CT; John Swanson, PhD, physicist

Cancer Treatment Centers of America

UC San Diego

AccuBoost team at University of California in San Diego (UCSD) from Left: Daniel Scanderbeg, PhD; Rachel Olaya, RTT, Radiation Therapist; John P. Einck, MD; Catherine Yashar, MD; and Stephanie Cuccinello, Medical Assistant

Mary Washington Healthcare
Mary Washington Hospital

The AccuBoost team at Mary Washington Hospital in Fredericksburg, VA From left, Bushra Rana, PhD, physicist; Renee Shank, BS RTT, Department Manager; John Chinault Jr., MD; Diane Jennings, RTT Therapist; William Pan, MS Physicist and Monica Lopez, RTT, Lead Therapist

"Throughout my professional life, I have been concerned about 'missing the target' with conventional external beam procedures. With AccuBoost I am relieved that I can deliver the partial breast dose accurately, every time."

~Rashmi Benda, MD

The principle author of the article "Are we missing the target?" now practicing at Lynn Cancer Institute, in Boca Raton, FL.

"Reflecting back on more than 200 patients that I have treated, I am confident that AccuBoost has been the best option for my breast cancer patients."

~Scot Ackerman, MD

The principal at Ackerman Cancer Center in Jacksonville, FL.

Q&A ON ACCUBOOST DOSING DESIGN / SCHEDULE

With David Wazer, M.D., Medical Advisory Board Chair

David Wazer, MD

The skin sparing feature of the AccuBoost technique allows for flexibility in the design and delivery of the procedure. While the original design concept of AccuBoost contemplated the delivery of the daily dose from four-fields from two orthogonal axes, in practice many have chosen to deliver the daily dose via two-field from a single axis, where the treatment axis alternates each day. The best industry practice of delivering AccuBoost dose is posed to David Wazer:

Q: What is your recommendation for the dose design?

A: AccuBoost provides significant dose reduction to the skin, when compared to conventional electron boost. As such, it allows for flexibility in delivering the boost dose. Our approach is to deliver the boost dose via two opposing fields of 100 cGy, from an alternating single axis each day.

Q: What has been your experience with this design?

A: We have been completely satisfied with this approach. Patients tolerate the procedure well. We find minimum to no skin reaction. Grade 3 skin toxicity has not been seen, and grade 2 is rare. We see mostly grade 1 or 0 skin reactions. This is noteworthy, as boost is a small component of the WBI dose.

Q: What do you gain with this approach?

A: Delivering the dose on one axis saves time as the need to reposition the patient and treatment on a second axis and additional images are eliminated. We typically treat the patient in less than 15-20 minutes.

Q: Do you recommend the same approach when AccuBoost is used for definitive (APBI) treatment?

A: We resort to the full four-field approach, when AccuBoost is used for APBI. The recommended dose of 360 cGy for APBI is delivered equally from 4 applicators positioned on, more or less, two orthogonal axes. We use the new generation, skin dose sparing (SDO) applicators whenever possible for this purpose and see very little skin reaction since we have started to use this product.

AccuBoost at ABS

AccuBoost will be exhibiting at the 2015 ABS Annual Meeting, April 9-11 at the Renaissance SeaWorld Hotel in Orlando, Florida.

AccuBoost at ACRO

Visit us at the 2015 ACRO Annual Meeting May 14-16 in Arlington, Virginia

ACRO American College of RADIATION ONCOLOGY *Integrating Science and Technology into Patient Care*

A PUBLICATION ON ACCUBOOST FOR APBI

ELSEVIER

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Brachytherapy 13 (2014) 493–501

BRACHYTHERAPY

The rationale, technique, and feasibility of partial breast irradiation using noninvasive image-guided breast brachytherapy

Jaroslaw T. Hepel[1,2,*], Jessica R. Hiatt[1], Sandra Sha[3], Kara L. Leonard[1,2], Theresa A. Graves[4], Doreen L. Wiggins[4], Dean Mastras[5], Ann Pittier[5], Brown University Oncology Research Group[6], and David E. Wazer[1,2]

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A recent article in the Brachytherapy Journal describes the feasibility of non-invasive breast brachytherapy (NIBB), the generic designation of AccuBoost, as an alternative to other APBI methods. The main points of this article are described here:

Rationale – Accelerated partial breast irradiation techniques that target radiation to the tumor bed and reduce the treatment time have been evaluated in recent years. Although APBI designs represent a significant advancement in terms of patient convenience, the techniques are not optimal for all patients. Non-invasive breast brachytherapy (NIBB) is described in this article as an attractive substitute - as it uses breast immobilization and real-time image guidance to deliver the partial breast dose.

Patient Selection – Forty patients were treated in this prospective clinical trial from 2011 to 2013 after receiving institutional review board (IRB) approval. The patient eligibility was in accordance with the American Brachytherapy Society consensus guidelines for APBI.

Method – NIBB dose was delivered via two orthogonal axes after the breast was compressed by mammography compression paddles, imaged to localize the tumor bed and appropriate sized applicators selected. The applicators were chosen to include the entire target volume consisting of the lumpectomy cavity and at least 1 cm of margin limited by chest wall and skin to cover the subclinical disease extension.

Applicator Selection and Dose – Three generations of applicators were used in this study. The investigation started with the first generation applicators, but quickly switched to second generation conical applicators that reduce the skin dose and treatment time, as they became available. Finally, towards the end of the study, the third generation round applicators with posterior wedge designs that allow closer positioning of applicators to the chest wall were included in the study.

A prescription dose of 34.0 Gy in 10 fractions was delivered either twice daily in 1 week or once daily over two weeks. Twice daily fractions were delivered at least six hours apart. The choice of daily or twice-daily treatment in this trial was based on patient preference. The treatment dose was prescribed to mid-point between the paired applicators,

Cont. on next page...

TREATMENT CHARACTERISTICS

Tumor Size (cm)	1.1 *(mean)*	0.3-3.0 *(range)*
Whole Breast Volume (cc)	1591 *(mean)*	365-3659 *(range)*
Tumor Bed Volume (cc)	22.4 *(mean)*	1.1 - 69.6 *(range)*
PTV (cc)	121.5 *(mean)*	33.0-461.5 *(range)*
Breast Compression (cc)	6.5 *(mean)*	3.4-9.4 *(range)*
Treatment Schedule		
Daily	72.5%	
Twice Daily	27.5%	
Applicators (size & shape)	Frequency of Use	
45 mm Natural D	32%	
5.0 cm Round	27%	
Acute Toxicity		
Pain	1 *(median)*	0-7 *(range)*
Acute Skin Reaction		
Grade 0	20%	
Grade 1	53%	
Grade 2	28%	
Grade 3 & Higher	0%	

"ACCUBOOST FOR APBI" *(cont.)*

delivered in equal parts from each of the four applicators

Results – The primary objective of the trial was to assess feasibility, patient tolerance and monitor any acute phase complications. All patients completed the treatment and the procedure was well tolerated. The discomfort associated with the treatment was minimum, as the pain was rated as 1 on the standard 10 point scale. The treatment delivery time was reported to be reasonable as the average time was 14 minutes per axis and the average time for the entire session, from start to finish, was reported to be under 43 minutes.

The treatment characteristics for the trial are presented on page 3. The most commonly used applicator sizes used in the trial were 45 mm Natural-D and 5 cm round. Most patients (72.5%) were treated on a once-daily schedule.

Discussions – The role and contribution of APBI approaches in limiting the treatment volume, shortening the treatment duration, reducing the associated toxicities and striving to improve the cosmetic outcome is well recognized. However, in practice, the APBI methods used in the last decade have created as many concerns as they have solved. The NIBB approach, as evaluated in this article, is found to be a reasonable alternative that avoids the need for invasive procedures. At the same time, NIBB is identified as an attractive replacement for the 3-D CRT design that requires expansion of CTV margins by 2.5 cm to accommodate daily setup, breast and patient movements and respiratory motion. This expansion results in substantially larger volume of normal tissue within the irradiated volume, causing more than expected late toxicity.

The NIBB approach, due to breast immobilization and the power of real-time mammography image guidance, irradiates much smaller volumes. Furthermore, breast compression displaces nontarget breast tissue out of the irradiated field, thereby reducing the risk of toxicity associated with larger treatment volumes. Thus NIBB has the potential to reduce the higher rate of toxicity and suboptimal cosmetic outcome.

The article identifies the lack of rigorous three-dimensional treatment planning as a challenge for NIBB. It describes some of the current efforts to overcome this challenge by consolidating the two-dimensional dose from each individual treatment axis. Finally, the article points out the challenges involved in using a low energy brachytherapy (Ir-192) source and recommends limiting the breast compression to < 8 cm to keep the skin-dose less than the prescription dose.

Conclusions – The study concludes that NIBB is feasible, well tolerated and is associated with mild and infrequent acute toxicities. The discomfort related to breast compression is minimal and the treatment is well accepted by patients. The ultimate conclusion of the article is that NIBB holds promise as an alternative method to deliver APBI.

Patient enrollment for APBI is continuing under a registry and the protocol is open for participation by all interested parties.

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