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ESTRO 2025: EMBRACE II results with Prof. Richard Pötter

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In this exclusive interview conducted at ESTRO 2025, Prof. Richard Pötter, MD, PhD, Professor Emeritus at the Medical University of Vienna, Austria, shares insights into the latest results from the EMBRACE II multicenter prospective interventional cohort study. Speaking with Maarten ter Mors, Senior Vice President and Head of Brachy Solutions at Elekta, Prof. Pötter discusses the clinical significance of the findings, their impact on the treatment of locally advanced cervical cancer, future research directions, and the vital role of education in advancing image-guided brachytherapy. The conversation took place on May 5th, 2025.

Q1. Professor Pötter, it was four years ago you presented the results of EMBRACE I, and today you will be awarded the Donal Hollywood Award. Congratulations on this incredible achievement! And you are now presenting EMBRACE II. How do you feel on this special day?

Well, it's a great experience today. Many people have put a lot of work into that in 49 centers, and now we were able to, in one year, put the results together. And we were very astonished that we had so very interesting results.

Q2. Could you briefly summarize the results of EMBRACE II?

First, most interesting is that we have outstanding results for survival. We have a 3-year overall survival rate of 87% and progression-free survival of 78%, which is really outstanding in a cohort comprising about 15% stage T3 or T4, and also many rather advanced disease in T2 (55% N+). And in a cohort which has a 30% reduced performance status, which means these patients are not completely healthy.

And we have a significant improvement in nodal control also, focusing on the External Beam part – there's lymph node boosting. And above all, we reduced very much the volumes in External Beam RT.

We could apply prospectively now a multi-parametric prescription protocol for brachytherapy. It was taken from the results of EMBRACE I, which seems to be very, very important.

And based on this intervention, very important is, that we have reduced morbidity significantly, in particular Grade 3 or higher. We have reduced fistula by almost 70% (absolute 1%). We have almost no treatment-related death. We have only two patients dying from late morbidity. And we had very few, less than 1% Grade 4, which is a life-threatening morbidity (before it was 4% in EMBRACE I). So, we are quite glad that we could reduce at the same time the morbidity events Grade 3 to 5.

These are the major findings. And it seems to work in a multicenter setting with very different institutions all over the world – from Australia, Canada, US, in Asia – in Hong Kong, in Bangkok, in India, and all over Europe.

Q3. We understand that the use of combination of intracavitary/interstitial (brachytherapy) had really increased in EMBRACE II. How do you see that in relation to the better results that you described?

I think if we look at the very large number of T2 patients, it has increased in that cohort, significantly also even in stage one, in large T1 patients. And that means that if we have better results in that stage, and less morbidity, this is due to the better possibilities of having combined intracavitary and interstitial brachytherapy to make the balance between dose to HR-CTV and organs at risk.

Q4. I think another important thing – you make all these big steps with EMBRACE II, fantastic results, but you could have also, when EMBRACE I was finished, it already made into guidelines. You could have said: We have established the standard of care, we are done. At that time, what made you decide to push forward with EMBRACE II?

I think we had a big success with EMBRACE I. This was an observational study. There was no dose prescription for brachytherapy, there was no target volume prescription. What is now available in EMBRACE II – we have a protocol, which is more practical, with prescription of doses and volumes,

and if you apply this protocol, you will arrive at 93% local control, 91% nodal control, 88% systemic control at 3 years. So, we have a „recipe“ that is prospectively proven in an interventional multicenter study, and that makes the difference to the observational EMBRACE I study.

Q5. This protocol, this recipe as you describe it, gives these fantastic results. Some people might argue that it's hard to implement this protocol in, let's say, a real-world setting. What's your view of that?

I think there are different aspects of real-world settings. The one aspect is MRI. It is true that the majority of centers have no access to MRI. And that's a big issue. There's a new trial coming up. And this trial will reach the cohort which has not been reached in EMBRACE I and II. Maybe, the results will be a little bit inferior, but it's very likely that they will reach more or less the local control and the nodal control. Again, the next step will be to prove that in a prospective trial (IMPACT).

The other issue of real-world setting is the selection of patients in the western world population. There is new data coming up that, particularly for chemotherapy, the most fragile patients are not fit to receive chemotherapy. However, the interim finding is that the outcome related to brachytherapy and external beam – meaning local and nodal control – are quite good. Obviously, this is just one center review on real-world data at present, which will be published soon in the Red Journal (Aarhus). We will also collect data on that issue, looking back a couple of years and looking at EMBRACE trial centers – what they included, and what they did in parallel in the real-world setting (REWIND). The major issue is chemotherapy, which means additional treatment may not help very much for a real-world population, because patients are even not fit to receive what is given currently.

Q6. Would it be fair to say that your next study will focus on getting great outcomes as in EMBRACE II, achieved in a larger group of patients?

Yes. Next study, it is PROMISE, includes members from as many EMBRACE and non-EMBRACE centers as possible to reach what is really done in a real-world setting. For local control I would expect something around 89–90%, and for nodal control similar. Systemic (control) will be less. And for that study, there is also an instrument we have developed: EVIGUIDE. The intervention is applied – dose and volume constraints are applied. And for the outcome – local, nodal, systemic control, and morbidity – we have a tool now with EVIGUIDE to forecast for the given patient what will likely be the outcome, and adjust accordingly the treatment for that patient.

Q7. I think one key element in all this has been education, and you pioneered right here in Vienna, I think in 2008, the first what we now call the Vienna workshop. Since then, there have been 30 (workshops), off the top of my head, 450 professionals were trained from 47 countries. How do you see the role of education in the proliferation of cervical brachytherapy or brachytherapy in general?

I think education is key, and we have had fellows and visitors all the time since we started some 25 years ago. Based on that, we started with an ESTRO teaching course, but there was no teaching for hands-on gynecologic brachytherapy. When we achieved first evidence – how it worked, the concepts, to where it evolved, and so on – we developed that teaching further.

Again, the ESTRO teaching course was more on frontal teaching, also some interactive teaching, a little bit hands-on, but what we needed was, in addition, sort of a hands-on workshop, like people coming to a center, practicing brachy, practicing with their hands, but also with their brain, translating what they do with their hands with their brain, and vice versa, because that's such an interplay. And the best is

to do it at a clinical site, and to teach the concept more summarizing, because it's written, published, and to do it in a very comprehensive continuous way (BrachyAcademy workshops). And we are quite happy to move on with that all the time and, I think, this increased the impact, because other people also tried to copy in a good way.

The teaching experience in India was also very interesting. We went to design a new form of a teaching course, which meant that some 15 centers were invited each year again, and people had to report on their progress, even giving small presentations on what to do, where you have shortcomings, where you have progress, and to share this experience with faculty experts.

One further interesting activity, for example, is BrachyTerra, which is specifically looking into the developing world, all over the world. I think that it is extremely important to have teaching online in Africa, in South America, in parts of Asia, and I think to support these ways of different diversities in teaching, education and very much practice is extremely important.

Q8. So you mentioned BrachyTerra, a fantastic initiative. We are also proud supporters of that. And the Vienna workshop has evolved into BrachyAcademy. If you look at education, there's travel, there's cost, there's time involved also from the teaching staff. What do you think would be an ideal way of teaching brachytherapy procedures?

Hybrid is fine but I don't believe that online alone will solve all issues, but it needs an additional personal communication, and also a hands-on communication. And a mixture in whichever way, I think, will be the future. I also know that from the ESTRO School, where I've been very active for quite a while, that just going to online alone is certainly not enough.

I think we should really be proud of what has been brought together now for 17 years – it's by the EMBRACE Collaborative Group. But we're also proud of the cooperation with the industry. It's quite outstanding that we have continuous financial support, beside other support, for such a period. And I hope that this will go on.

“I can confirm this on video. It will go on. And we are also very proud and humbled that we can have a small contribution in the success for patients. Thank you”, Professor Pötter.

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