**Purpose:** combining lumpectomy and axillary’s dissection with whole breast irradiation has resulted in a safe and effective alternative to mastectomy, with low toxicity and only 3% of breast recurrence. More recent partial breast irradiation has aimed at decreasing the local toxicity and overall treatment time. The validity of this accelerated partial breast irradiation (APBI) is supported in the study of “in breast-recurrence” patterns, pathologic data, and the clinical treatment experience, with phase II study using interstitial brachytherapy. The approaches described to date APBI are: interstitial brachytherapy LDR and HDR (low and high dose rate), endocavitary brachitherapy using a balloon catheter (MammoSite) and single-fraction intra-operative irradiatin (IORT) on using 6 – 9 MeV energy electron with linear accelerator or 50 kV orthovoltage radiation.

In our Institution there is a experimental study of fase II: partial breast perioperative irradiation after conservative surgery. We do brachytherapy implant, after excision of breast neoplasia, when the “T” is ≤ 3 cm, and is an infiltrating ductal carcinoma, with clear margins of resection. The tratment is performed by Microselectron HDR Unit. After in local anaesthesia perioperative implant, CT slices were acquired and sent to TPS Plato in order to simulate the treatment. The dose was calculated by Paris Dose System (PDS) or by Stepping Source Dosimetry System (SSDS): the reference dose is taken as 85% of the mean basal dose (that is the arithmetic mean of the local minimum doses between each set of three adjacent source lines within the source pattern). The total reference dose is of 35 Gy (3.5 Gy 2fr./die). The overall time treatment is 6 days. The treatment plans were valued taking skin dose, natural histogram, and quality and uniformity index into consideration.

The APBI with perioperative brachytherapy is a feasibility and good method: non acute or chronic severe toxicities are realized., and cosmetics results are good.

Figure illustrate sequences of brachytherapy implant:

and excellent cosmetic results.
Purpose: Combining lumpectomy and axillary dissection with whole breast irradiation has resulted in a safe and effective alternative to mastectomy, with low toxicity and only 3% of breast recurrence. More recent partial breast irradiation has aimed at decreasing the overall treatment time.

The validity of this accelerated partial breast irradiation (APBI) is supported in the study of “in breast-recurrence” patterns (1,2,3), pathologic data (4,5) and the clinical treatment experience, with phase II study using interstitial brachytherapy. The approaches described to date APBI are: interstitial brachytherapy LDR and HDR, endocavitary brachitherapy using a balloon catheter (MammoSite) and single-fraction intra-operative irradiation using electron beams 6 – 9 MeV energy with linear accelerator or 50 kV orthovoltage radiation (6,7,8,9).

We present the preliminary results of the multicenter clinical study testing partial breast irradiation obtained by interstitial HDR brachytherapy, with intra-operative catheters placement, in women with early-stage breast cancer treated with breast-conservative therapy.

Methods and Materials: from January to May 2005 twenty-one patients were enrolled, implanted during surgery and treated by Microselectron-HDR unit. The median patient age was 69.3 years (range 50-79). The patients enrolled had an infiltrating ductal carcinoma < 2 cm in diameter (14 patients had tumour diameter less than 1cm), clear surgical margins and their tumour did not contain an extensive intraductal component. Sentinel node was positive in 2 pts and 16 pts had hormonal positive receptors. Chemotherapy was available in 2 patients. After the operative implant, done in local anaesthesia, CT slices were acquired and sent to TPS Plato in order to simulate the treatment. The dose was calculated by Paris Dose System (PDS) or by Stepping Source Dosimetry System (SSDS): the reference dose is taken as 85% of the mean basal dose (that is the arithmetic mean of the local minimum doses between each set of three adjacent source lines within the source pattern). A reference dose of 35 Gy (3.5 Gy 2fr./d) was delivered in 20 pts and a 31.5 Gy one (3.5 Gy 2fr./d) in 1 pt. The average time of treatment was equal to 6.27 days (range 6–9).

Catheters were implanted in a single-plane in 1 pt, in a double-plane in 17 pts, in a triple-plane in 3 pts. The mean volume surrounded by the 35 Gy isodose was 60.6 cc (range 20
The treatment plans were valued taking skin dose, natural histogram, quality and uniformity index into consideration.

**Results and Conclusion:** The technical feasibility of the method is good: the average treatment time is 6.7 days starting from implant, more over no fever or surgical acute injury, local hemorrhage or infection are observed. About acute toxicity we have observed one grade 3° erythema in 2 pts e one suture dehiscence in 1 pts. In patients with adequate follow-up late toxicity consists in a slight subcutaneous fibrosis with good cosmetic results (slight skin retraction or oedema, iperpigmentation, theleangectasie or evident catheters skin intersection-points). Therefore these initial data demonstrate that interstitial intra-operative brachytherapy implant is a feasible method with good tolerance.

**References:**