

## **About Dynamic Angiothermography**

Dynamic angiothermography, or DATG, was developed about 30 years ago on the basis of Prof. Jean Tricoire's work at the University of Paris. A non-invasive, entirely painless approach that can be applied to women of all ages, DATG can be repeated at will without any chemical or radiological risk whatsoever to patients. Indeed, tests run under the supervision of agencies certified by Italy's Public Health Ministry have shown that DATG is a risk-free diagnostic technique. Not to mention the fact that it is simple to operate and inexpensive. Perhaps its most salient feature is that early diagnosis can be performed at any age with a highly significant prevention rating.

Unlike the obsolete 'contact thermography', DATG does not use quantitative measurements of emitted heat as diagnostic criteria. Rather, it is based on qualitative interpretations of the breast's blood-flow lines, a feature that is making DATG increasingly more valuable both clinically and scientifically. DATG it is not the “old contact thermography”.

If to this we add the growing interest of the medical and scientific community in tumour neo-angiogenesis, the fact that DATG has proven it can localise pre-cancerous and pre-invasive lesions of breast cancer becomes all the more important. Indeed, recent studies have shown that the blood supply needed for tumour onset is always accompanied by this type of lesion in the initial stage of invasiveness.

While DATG is fully comparable to the familiar diagnostic techniques of mammography and ultra-sound, it can detect at a notably early age even minimal lesions in cases of tumour pre-invasiveness like atypias and in situ carcinomas. DATG, by its very nature, is thus convergent, not in competition, with these other techniques.

A DATG check-up is based on the semeiotic reading of the images that appear when its liquid-crystal plate is placed on the breast. These images are read and recorded so that they can also be used in a valid screening programme.

The main developer of this technique was Prof. G. C. Montruccoli since 1975, with more than 6,900 patient , with a 25-year (10-year average) follow-up. We can call this new diagnostic technique : “Montruccoli Method”

The semeiotics of the images have been verified over time. the fact that they are reproducible has brought to the fore three notably important clinical characteristics:

- ❖ every woman has her own individual pattern (even homozygote twins have individual patterns that, while similar, are not identical)

- ❖ every pattern is constant even after more than 20 years when no pathology is present
- ❖ no pattern depends on lesion size (even in situ lobular cancer can show a blood-flow line over 15 cm. long).

Nearly 7,000 patients have participated in our DATG studies and, when age permitted, in parallel control with mammography and ultra-sound.

While it is not yet possible to assess with scientific objectivity the full value of the technique's sensitivity and specificity, prospective studies are now under way in this connection.

We should like to cite in closing a particular instance of diagnostic feedback: Lobular carcinomas have been diagnosed by DATG at a three times higher rate than ductal, in contrast to the reports in literature. Note, too, that the average age at diagnosis is 40.

### **DATG was developed by:**

*Prof. G.C. Montruccoli,*

University Campus Biomedico of Rome, member of the Gynaecology and Oncology Committee of the International Federation of Gynaecology and Obstetrics (FIGO)  
Member of the International Society of Senology (S.I.S.) Committee of Expert

*Prof. Franco Casali*

University of Bologna Department of Medical Physic

*Prof. Daniele Montruccoli Salmi,*

Oncologist and Gynaecologist

Assistant étranger at the University of Paris - South,

Fellow in Oncology at the Institute Gustave - Roussy Villejuif -Paris

Adjunct Professor in Oncology, University of Rome "La Sapienza" Department of Thoracic Surgery.

*Dr. Stefano Brusori,*

Specialist in radio-diagnostics and radiotherapy

I° Medical Level at Policlinico Sant'Orsola-Bologna

## Results

Since 1975, more than 6,900 patient have undergone DATG examinations as part of our clinical practice, with a 25-year (10-year average) follow-up. Each visit was recorded and stored in an archive containing more than 200,000 DATG slides; mammography and ultra-sound records are also available in many cases. The results reported below refer to the period 1975-2001 for 6,550 patients and 1,027 biopsies.

<b>Histological diagnosis</b>	<b>No.</b>	<b>%</b>	<b>% group</b>
1. Benign	143	13.90	
2. Mastitis and/or ectasia	180	17.50	31.40
3. Simple ductal hyperplasia	169	16.45	
4. Florid ductal hyperplasia	235	22.88	39.33
5. Papillomatosis	46	4.47	4.47
6. Atypical duct hyperplasia	7	0.68	
7. Atypical lobular hyperplasia	23	2.23	4.20
8. Mixed atypical hyperplasia	13	1.26	
9. Ductal carcinoma in situ	15	1.46	
10. Lobular carcinoma in situ	28	2.72	5.56
11. Mixed carcinoma in situ	15	1.46	
12. Ductal microinvasive cancer	2	0.19	
13. Lobular microinvasive cancer	5	0.48	0.90
14. Mixed microinvasive cancer	2	0.19	
15. Ductal invasive carcinoma	123	11.97	
16. Lobular invasive carcinoma	15	1.46	13.83
17. Mixed invasive carcinoma	4	0.38	
Malignant phyllodes	2	0.19	0.19
TOTAL	1,027		

	<u>Before 50 years</u>	<u>After 50 years</u>
❖ Preinvasive ( in situ )	9,3%	6,8%
❖ Invasive	19,5%	22,5%

Note that the incidence of epithelial lesions, including florid hyperplasia, runs to 70%. Another new finding is the high incidence, i.e. more than double, of lobular with respect to ductal lesions.

Note, too, that the pre-invasive rate before the age of 50 is 10% and that the rate of invasive cancers before the age of 50 is almost as high as that after 50, i.e. 19.5% versus 22.5%.

## **COLLABORATIVE GROUPS IN DATG** **CLINICAL AND RESEARCH**

- J.A.Pinotti; M.Pinotti; F.Carvalho  
State University S.Paolo-Brasil
- G.Lindeque  
University of Pretoria-South Africa
- V.Altomare  
University Campus Bio-Medico- Rome-Italy
- F.Schmitt-M.J.Cardoso  
University of Porto-Portugal
- G.Bevilacqua; A.Cavazzana  
University of Pisa-Italy
- C.Scipioni  
Centro prevenzione mammaria e terapia – Avezzano-Italy
- D.Montruccoli  
Centro di Senologia -Villa Mafalda – Roma-Italy
- E. Lifränge  
Université de Liege -Belgique
- D.Vanel  
Institut Gustave Roussy-Villejuif- France
- J.Bojages  
National Breast cancer center –Sidney

Italy's national “Istituto Superiore di Sanità” has approved and introduced DATG in a prospective study for the prevention of breast cancer in carriers of the cancer-correlated genes BRCA1 and BRCA2.

## **Bibliography**

Montruccoli GC, Grigioni WF, D'Errico A, Barnabé, Zeferino LC, Cairo AAA, Pinotti JA. Carcinoma in situ da mama e sua detecção através da termografia de placa. *Rev Bras Ginecol Obstet* 1989;5:87-90.

Montruccoli GC, D'Errico A. Angiothermographic patterns in the detection of breast carcinoma in situ. In: Belfort P, Pinotti JA, Eskes TKAB eds. *Advances in Gynecology and Obstetrics: vol. 3 Gynecological Cancer*. Proceedings of the XIIth FIGO World Congress of Gynecology and Obstetrics, Oct. 1988, Rio de Janeiro. New York: Parthenon, 1989:101.

Montruccoli GC. Diagnosing breast diseases: selecting and integrating instrumental procedures. In: Popkin DR and Peddle LJ eds. *Women's Health Today: Perspectives on Current Research and Clinical Practice*. Proceedings of the XIV World Congress of Gynecology and Obstetrics Montreal, Sept 1994. New York: Parthenon 1994:331-6.

Montruccoli GC, Montruccoli DS, D'Errico A, Grigioni WF. Angiothermography in an integrated diagnosis for secondary prevention of breast cancer. In: *Lancet Conference - The Challenge of Breast Cancer*, Brugge, 21-22 April 1994. London: The Lancet, 1994:49.

Montruccoli GC, Montruccoli-Salmi D. Dynamic angiothermography and x-ray mammography for early diagnosis of breast cancer. *Eur J Thermol* 1997;7:197-201.

Montruccoli GC, Montruccoli-Salmi D, Barnabé D. Early diagnosis of breast cancer by dynamic angiothermography. In: Ottesen B, Tabor A eds. *New Insights in Gynecology and Obstetrics: Research and Practice*. Proceedings of the XIV FIGO World Congress of Gynecology and Obstetrics; Copenhagen, Aug 1997. New York: Parthenon, 1998:296-300.

## **Last Paper 2003-4**

*Naccarato AG, Viacava P, Vignati S, Fanelli G, Bonadio AG, Montruccoli G, Bevilacqua G.*

Bio-morphological events in the development of the human female mammary gland from fetal age to puberty.

**VIRCHOWS ARCHIV-AN INTERNATIONAL JOURNAL OF PATHOLOGY, num. 5, vol. 436, pp. 431-, 2000**

*Naccarato AG, Viacava P, Bocci G, Fanelli G, Aretini P, Lonobile A, Montruccoli G, Bevilacqua G,*

Definition of the microvascular pattern of the normal human adult mammary gland.,  
**JOURNAL OF ANATOMY, vol. 203, pp. 599-603, 2003**

*G.C. Montruccoli, D. Montruccoli Salmi, F. Casali*

A new type of breast contact thermography plate: a preliminary and qualitative investigation of its potentiality on phantoms.

**PHYSICA MEDICA Vol.XX, N.1, January-March 2004 pp.27-31**

*Daniele Montruccoli , Franco Casali , Stefano Brusori, Paolo Barillari, Corrado Scipioni et Gian Carlo Montruccoli*

“L’angiothermographie dynamique : un avenir ?”

**L’AGENDA GYNECOLOGIE , Mars 2005 pag.42-43**

*G.C. Montruccoli, D.Montruccoli, D.Barnabe’, V.Altomare*

*Thermography fiction or reality?*

**INTERNATIONAL JOURNAL OF OBSTETRICS AND GYNAECOLOGY  
Vol. 83 Supplement N.3 pag.18 November 2-7 2003**

*G. C. Montruccoli, D. Montruccoli, F.Casali, S. Brusori, W. F. Grigioni, A. G. Naccarato, P. Viacava, N. Decarli, A. Cavazzana, G. Bevilacqua.*

Clinical application of a new thermographic plate: histopathological findings of 1027 breast lesions.

**95<sup>TH</sup> AMERICAN ASSOCIATION FOR CANCER RESEARCH AACR ANNUAL MEETING 27-31 MARCH 2004**

*Viacava P., Naccarato A.G., Bocci G., Fanelli G., Aretini P., Lonobile A., Montruccoli G.C., Bevilacqua G.*

Angiogenesis and VEGF expression in pre-invasive lesions of human breast .  
**JOURNAL OF PATHOLOGY 2004; 204: 140-146**

## ICONOGRAPHY



DATG Functional Unit



The workstation