¿QUÉ HAY DE NUEVO EN CIRUGÍA PARATIROIDEA?

Norberto Cassinello Fernández

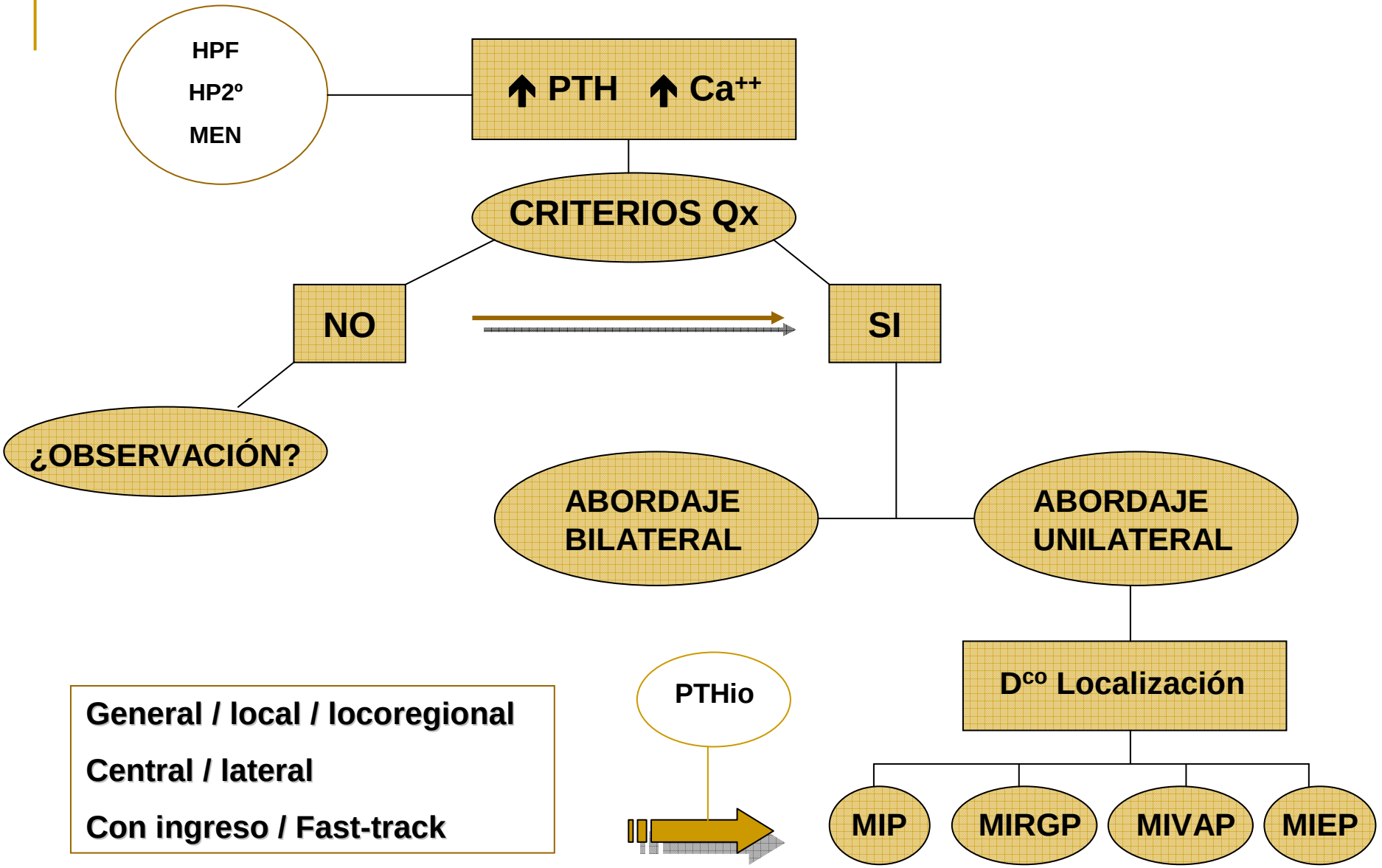
Unidad Cirugía Endocrina y Obesidad

Servicio Cirugía general y Aparato Digestivo

Hospital Clínico Universitario

Valencia

XXII CURSO SOCIEDAD VALENCIANA CIRUGÍA. 1,2 FEBRERO 2007


HPF
HP2º
MEN
↑ PTH ↑ Ca++
CRITERIOS Qx
NO
SI
¿OBSERVACIÓN?
ABORDAJE BILATERAL
ABORDAJE UNILATERAL
Dco Localización
MIP
MIRGP
MIVAP
MIEP
PTHio
General / local / locoregional
Central / lateral
Con ingreso / Fast-track

Summary Statement from a Workshop on Asymptomatic Primary Hyperparathyroidism: A Perspective for the 21st Century

JOHN P. BILEZIKIAN, JOHN T. POTTS, JR., GHADA EL-HAJJ FULEIHAN,MICHAEL KLEEREKOPER, ROBERT NEER, MUNRO PEACOCK, JONAS RASTAD,SHONNI J. SILVERBERG, ROBERT UDELSMAN, AND SAMUEL A. WELL

Department of Medicine, Columbia University College of Physicians and Surgeons (J.P.B., S.J.S.), New York, New York 10032; Department of Medicine, Massachusetts General Hospital, Harvard Medical School (J.T.P., R.N.), Boston, Massachusetts 02114; American University of Beirut Medical Center (G.E.-H.F.), Beirut, Lebanon; Department of Medicine, Wayne State University School of Medicine (M.K.), Detroit, Michigan 48201; Department of Medicine, Indiana University School of Medicine (M.P.), Indianapolis, Indiana 46202; Department of Surgery, University Hospital (J.R.), Uppsala, Sweden; Department of Surgery, Yale-New Haven Hospital, Yale University School of Medicine (R.U.), New Haven, Connecticut 06520; and Department of Surgery, Duke University Medical Center (S.A.W.), Durham, North Carolina 27710

The Journal of Clinical Endocrinology & Metabolism 87(12):5353–5361

TABLE 1. A comparison of new and old guidelines for parathyroid surgery in asymptomatic primary hyperparathyroidism

Measurement	Guidelines (1990)	Guidelines (2002)
Serum calcium (above upper limit of normal)	1–1.6 mg/dl	1.0 mg/dl
24-h urinary calcium	>400 mg	>400 mg
Creatinine clearance	Reduced by 30%	Reduced by 30%
Bone mineral density	*z*-score <−2.0 (forearm)	*t*-score <−2.5 at any site
Age	<50	<50

Surgery is also indicated in patients for whom medical surveillance is neither desired nor possible.

¡ SOLO 20-25% PACIENTES ¡

¿ HIPERPARATIROIDISMO 1º ASINTOMÁTICO ?

Primary Hyperparathyroidism, Cognition,and Health-Related Quality of Life

Laura H. Coker, PhD, Kashemi Rorie, PhD,† Larry Cantley, MD,‡ Kimberly Kirkland, PsyD,†David Stump, PhD,† Nicole Burbank, MD,§ Terry Tembreull, BA,* Jeff Williamson, MD,‡and Nancy Perrier, MD*

***Ann Surg* 2005;242: 642–650**

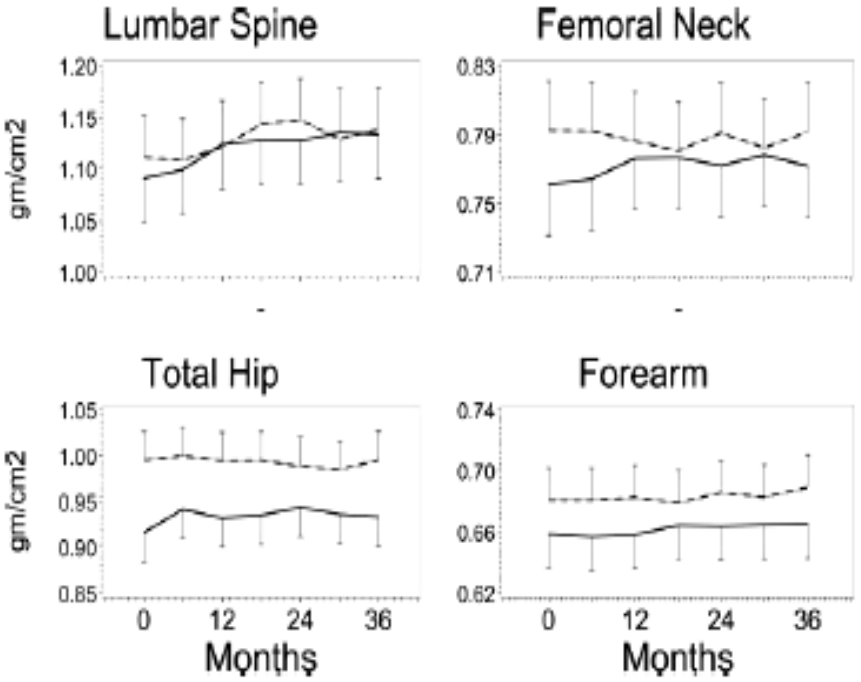
AUTOR	AÑO	N	TEST	FUNCIÓN FÍSICA	EMOCIONAL	FATIGA
Pasieka	2002	203	PAS	+	+	+
Sheldon	2002	72	MOS SF-36	+	+	+
Quiros	2003	60	HSQ	+	+	+

Randomized Controlled Clinical Trial of Surgery *Versus* No Surgery in Patients with Mild Asymptomatic Primary Hyperparathyroidism

D. SUDHAKER RAO, EVELYN R. PHILLIPS, GEORGE W. DIVINE, AND GARY B. TALPOS

Division of Endocrinology and Bone and Mineral Metabolism, Departments of Medicine (D.S.R., E.R.P.), Biostatistics(G.W.D.), and Surgery (G.B.T.), Henry Ford Hospital, Detroit, Michigan

The Journal of Clinical Endocrinology & Metabolism Dec 2004; 89(11):5415–5422



Despite the mild disease and asymptomatic status, there appeared to be measurable effects of surgery on BMD, quality of life, and psychological function. With the advent of minimally invasive surgery, a more liberal approach to surgery is recommended...

Cost-effectiveness analysis of parathyroidectomy for asymptomatic primary hyperparathyroidism

Kyle Zanocco, BS, Peter Angelos, MD, PhD, *and* Cord Sturgeon, MD,*Chicago,Ill*

Surgery 2006;140:874-82.

...Parathyroidectomy is more cost-effective than observation for managing asymptomatic PHPT patients who do not meet National Institutes of Health criteria for parathyroidectomy. Furthermore, pharmacologic therapies with a greater than $221 annual cost were not cost-effective in this model...

Modelo matemático

Sistema americano

Ajustado año/calidad vida

Ratio incremento coste/efectividad

ABORDAJE BILATERAL VS ABORDAJE UNILATERAL

	Año	n	Técnica	Tº Qx	Curación	Segto	NLR	HipoCa
Russell	2006	190	MIP	65´	100%	3-5 años	0	0
Bergenfelz	2004	50	MIP (local)	41´	98%	6 meses	0	0
Soon	2006	700	MIP (lateral)	60´	97%	1-3 años	4	1

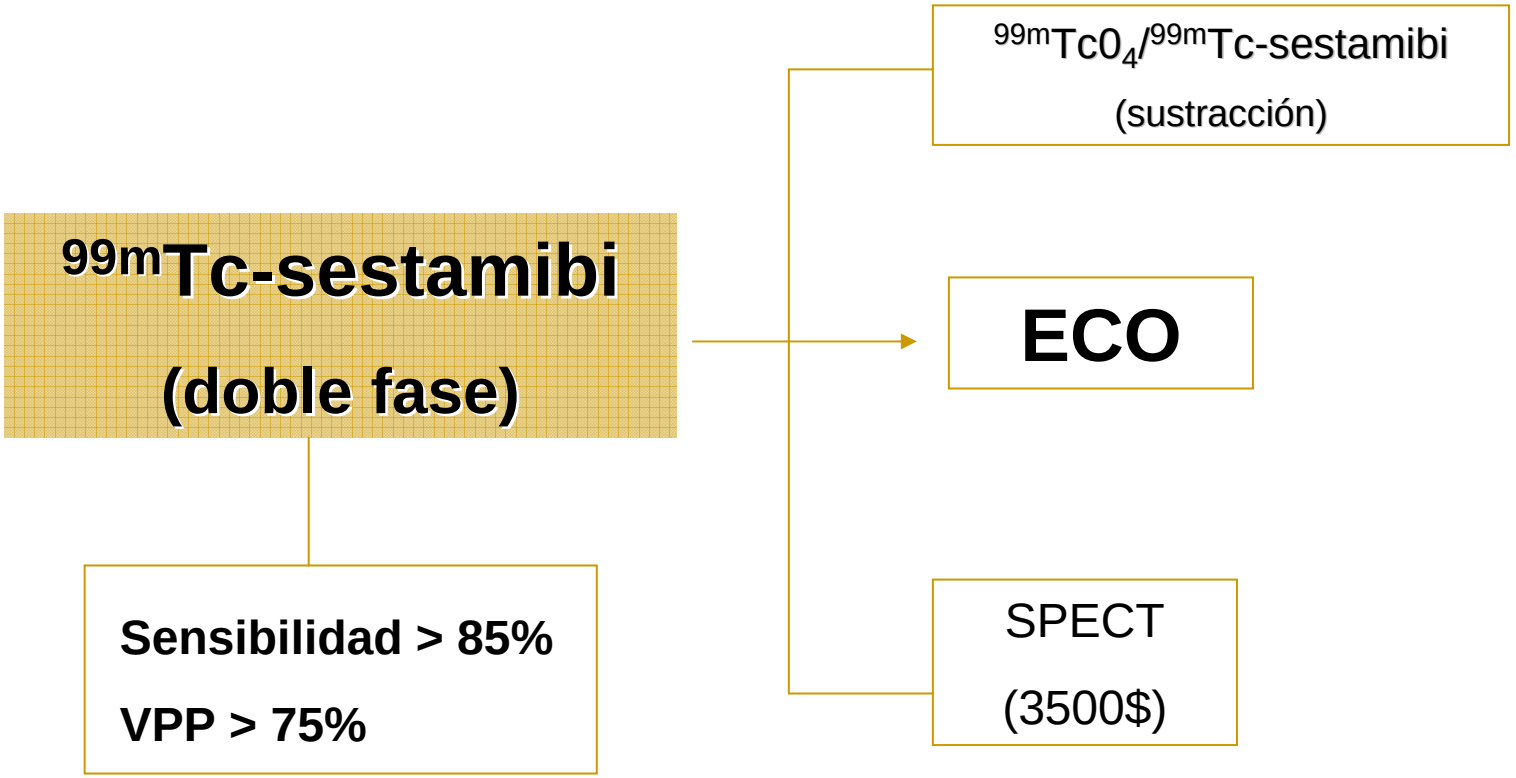
“...ya no debe haber debate alguno sobre la legitimidad de la exploración unilateral del cuello como opción apropiada para el paciente con hiperparatiroidismo primario...”

Russell C. Unilateral exploration for primary hyperparathyroidism. Surg Clin North America. June 2004; 84(3): 663-675

A Comprehensive Evaluation of Perioperative Adjuncts During Minimally Invasive Parathyroidectomy. *Which Is Most Reliable?*

Herbert Chen, MD, FACS, Eberhard Mack, MD, FACS, and James R. Starling, MD, FACS

***Ann Surg* 2005;242: 375–383**



PARATIROIDECTOMIA MINIMAMENTE INVASIVA

Targeted parathyroidectomy in the era of intraoperative parathormone monitoring.

Inabnet W, Dakin G, Haber R, Rubino F, Diamond E, Gagner M.

World J Surg 2002; August 8(26): 921-925.

	N	curación	tº
MIP	37	100%	57min
MIRP	59	100%	62min
MIEP	14	100%	**146 min**

¿ $$?

Minimally Invasive Video-Assisted Parathyroidectomy Versus Open Minimally Invasive Parathyroidectomy for a Solitary Parathyroid Adenoma: A Prospective,Randomized, Blinded Trial

Marcin Barczyn´ ski, MD, PhD, Stanis³aw Cichon´ , MD, PhD,

Aleksander Konturek, MD, PhD, Wojciech Cichon´, MD

World J Surg 2006; 30: 721–731

Postoperative follow-up of pain by visual analog score (VAS), analgesia request, complications, scar length, cosmetic satisfaction, quality of life (QOL) on recovery, and hospital stay and costs analysis

	MIVAP (n = 30)	OMIP (n = 30)	*P*
Success rate (%)	100	100	1.0[b]
Transient hypocalcemia (no.)	3	3	1.0[b]
Pain at 4 h (VAS)	24.9 ± 6.0	32.2 ± 4.6	<0.001[a]
Pain at 8 h (VAS)	26.4 ± 4.5	32.0 ± 4.8	<0.001[a]
Pain at 12 h (VAS)	19.5 ± 4.8	25.4 ± 3.8	<0.001[a]
Pain at 24 h (VAS)	15.5 ± 5.4	20.4 ± 4.7	<0.001[a]
Analgesia request 24 h (no.)	19	27	0.01[b]
Analgesic consumption 24 h (mg)	51.6 ± 46.4	121.6 ± 50.3	<0.001[a]
Transient RLN palsy (No)	0	1	0.31[b]
Scar length (mm)	17.2 ± 2.2	30.8 ± 4.0	<0.001[a]
Cosmetic satisfaction at 1 month (VAS)	85.4 ± 12.4	77.4 ± 9.7	0.006[a]
at 6 months	90.5 ± 10.3	87.5 ± 5.8	0.16[a]
Hospital stay (hours)	28.0 ± 10.1	31.1 ± 9.7	0.22[a]
QOL on 7th postoperative day			
Physical functioning	88.4 ± 6.9	84.6 ± 4.7	0.02[a]
Bodily pain	90.3 ± 4.7	86.5 ± 4.9	0.003[a]
Hospital stay cost ($US)			
Surgery alone	465 ± 39.7	350 ± 37.1	<0.001[a]
Total	1,150 ± 63.4	1,015 ± 61.8	<0.001[a]

MIP vs MIRP vs MIVAP vs MIEP

Worldwide trends in the surgical treatment of primary hyperparathyroidism in the era of minimally invasive parathyroidectomy.

Sackett W, Barraclough B, Reeve T, Delbridge L.

Arch Surg. 2002; 137:1055-1059

International Association of Endocrine Surgeons

N = 177 (326)

60% Abordaje unilateral

60% MIP / 20% MIVAP / 20% otras

50% central / 50% lateral

Focused parathyroid surgery with intraoperative parathyroid hormone measurement as a day-case procedure

E. M. Gurnell[1], S. K. Thomas[2], I. McFarlane[3], I. Munday[4], K. K. Balan[5], L. Berman[6], V. K. K. Chatterjee[1] and G. C. Wishart[2]

Departments of [1]Medicine, [2]General Surgery, [3]Clinical Biochemistry, [4]Anaesthesia, [5]Nuclear Medicine and [6]Radiology, Addenbrooke's Hospital, Cambridge, UK

British Journal of Surgery 2004; **91**: 78–82

Outpatient minimally invasive parathyroidectomy using local/regional anesthesia: A safe and effective operative approach for selected patients

Mark S. Cohen, MD,[a] Steven E. Finkelstein, MD,[a] L. Michael Brunt, MD,[a] Elizabeth Haberfeld, MD,[a] Ivan Kangrga, MD, PhD,[b] Jeffrey F. Moley, MD,[a] *and* **Terry C. Lairmore, MD,[a]** *St. Louis, Mo*

Surgery 2005;138:681-9.

Local/Cervical block anesthesia vs general anesthesia for minimally invasiva parathyroidectomy. What are the advantages?

Black M, Ruscher A, Lederman J, Chen H.

Ann Surg Oncol 2006

Clinical Chemistry 46:10
1662–1668 (2000)

Endocrinology and Metabolism

Intraoperative Parathyroid Hormone Analysis: A Study of 200 Consecutive Cases

Lori J. Sokoll,[1*] Helen Drew,[1] and Robert Udelsman[2]

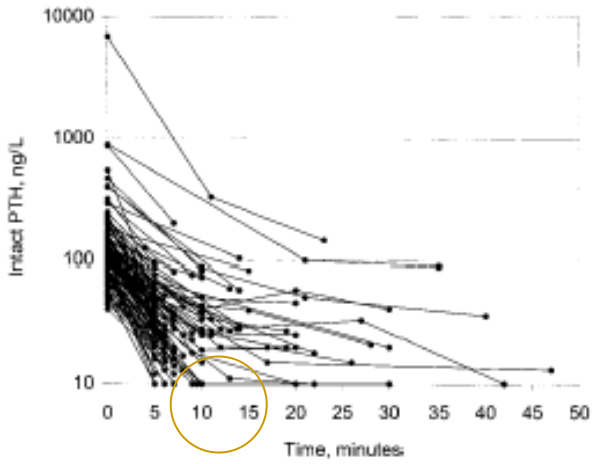


Fig. 2. Intact PTH concentrations in 149 primary hyperparathyroid patients with single adenomas.

PTH concentrations below the assay limit of detection (11 ng/L) were assigned a value of 10 ng/L.

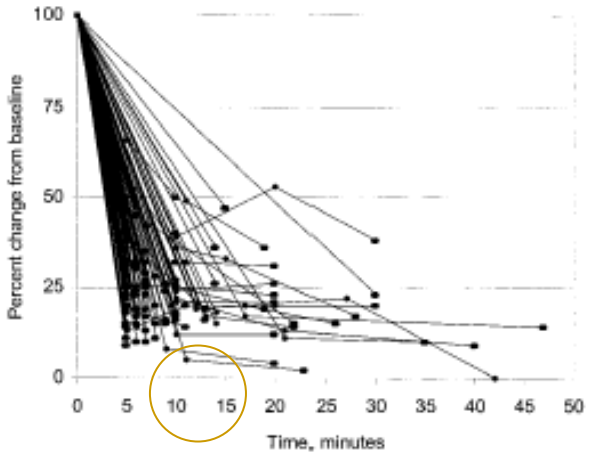


Fig. 3. Percentage change in intact PTH from baseline in 149 primary hyperparathyroid patients with single adenomas.

Focused cervical exploration for primary hyperparathyroidism without intraoperative parathyroid hormone monitoring or use of the gamma probe.

Jacobson S et al.

World J Surg 2004; 28:1127-1131

80% HP1º: adenoma único

Coste PTHio: 185 $ (x3=555$)

N=100 ⟶ Curación: 97%

Successful minimally invasive parathyroidectomy for primary hyperparathyroidism without using intraoperative parathyroid hormone assays

Ollila D et al.

Am J Surg 2006; 191:52-56

PTH: propofol, lugar extracción?

N= 77 ⟶ Curación:97%

THE AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND THE AMERICAN ASSOCIATION OF ENDOCRINE SURGEONS POSITION STATEMENT ON THE DIAGNOSIS AND MANAGEMENT OF PRIMARY HYPERPARATHYROIDISM

AACE/AAES Task Force on Primary Hyperparathyroidism

Co-Chairpersons

John S. Kukora, MD, FACS, FACE

Martha A. Zeiger, MD, FACS

Committee Members

Orlo H. Clark, MD, FACS

Clive S. Grant, MD, FACS

Stephen F. Hodgson, MD, MACE

George L. Irvin III, MD, FACS

Michael Kleerekoper, MD, FACE

Janice L. Pasieka, MD, FACS

Ashok R. Shaha, MD, FACS

Geoffrey B. Thompson, MD, FACS, FACE

Jon A. van Heerden, MD, FACS, FRCSC

Collin J. Weber, MD, FACS

ENDOCRINE PRACTICE Vol 11 No. 1 January/February 2005 49

BENEFITS AND RISKS OF OPERATIVE MANAGEMENT

Operative management is currently the only curative therapy for patients with PHPT.

MEDICAL MANAGEMENT

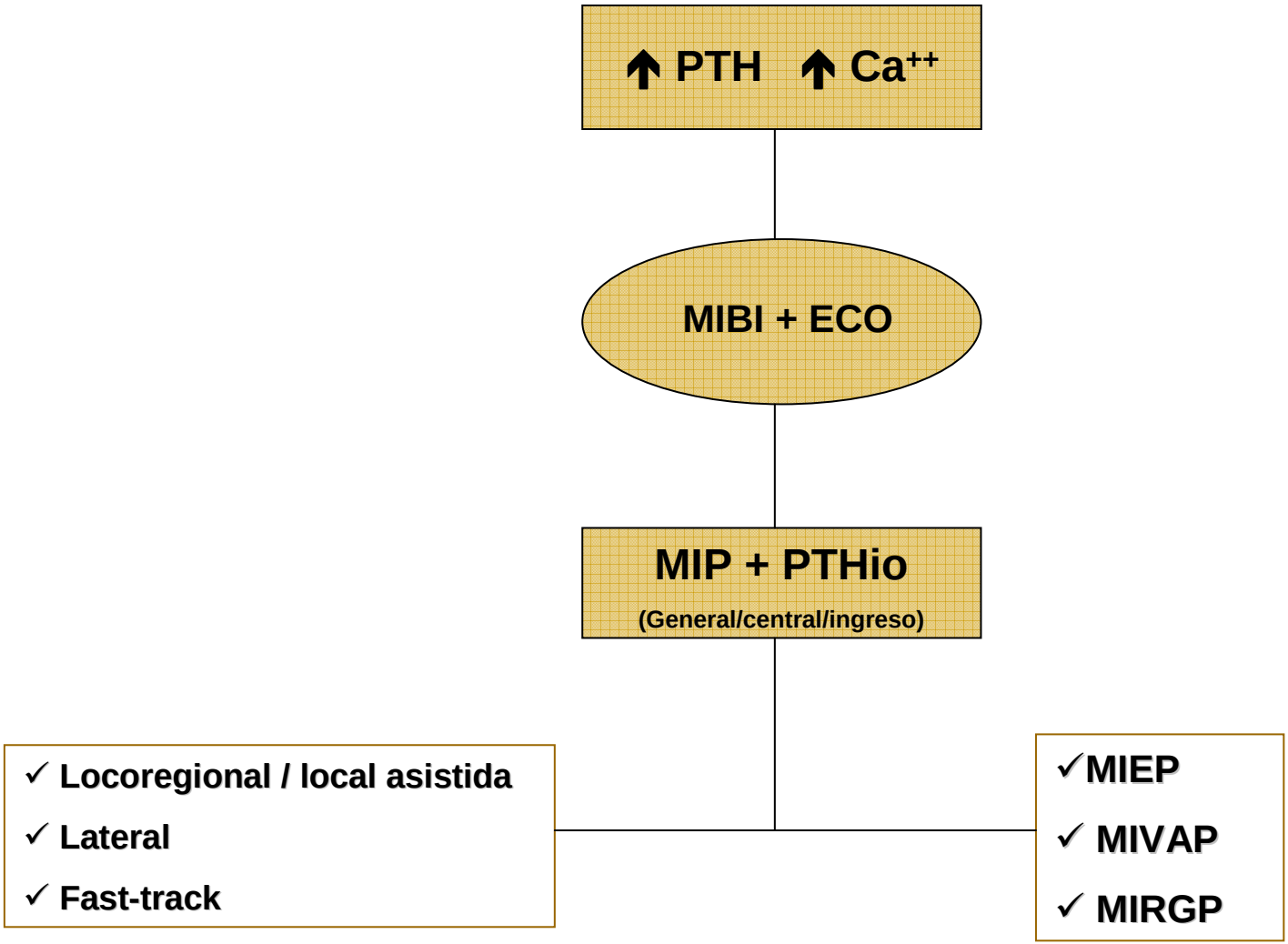
No convincing data support the long-term efficacy of medical therapy or simply observation in the management of PHPT. Patients with mild HPT should be kept well

CONSENSUS GUIDELINES FOR RECOMMENDATION OF SURGICAL TREATMENT

The surgical approach to patients with PHPT is likely to remain a surgeon-specific strategy, depending on experience, preferences, and availability of new technologies.

At present, no consensus exists about the need for any of these new modalities for optimal initial parathyroid operative success, and the cost-effectiveness of these technologies, alone or in combination, may vary among differing practice environments.

Ultimately, none of these technologies is a substitute for an experienced surgeon.


↑ PTH ↑ Ca++
MIBI + ECO
MIP + PTHio
(General/central/ingreso)
✓ Locoregional / local asistida
✓ Lateral
✓ Fast-track
✓MIEP
✓ MIVAP
✓ MIRGP

Potential role of a new hand-held miniature gamma camera in performing minimally invasive parathyroidectomy

Joaquin Ortega[1], Jose Ferrer-Rebolleda[3], Norberto Cassinello[2], Salvador Lledo[1]

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[2] Unit of Endocrinologic and Bariatric Surgery, Clinic University Hospital, Valencia, Spain
[3] Department of Nuclear Medicine, Clinic University Hospital, Valencia, Spain

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Eur J Nucl Med Mol Imaging (2007) 34:165–169
DOI 10.1007/s00259-006-0239-7

GEM IMAGING

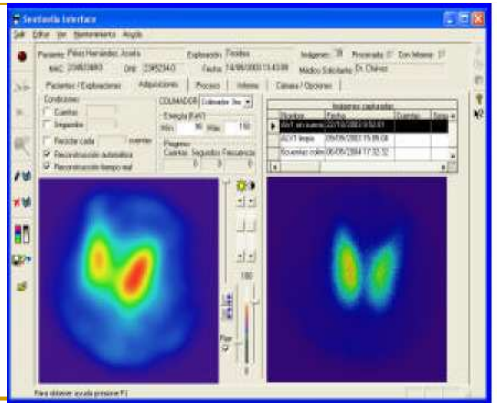
General Equipment for Medical Imaging S.L.
C/ Benjamín Franklin 12-3, Technological Park
46980 Paterna – Valencia – SPAIN
sentinella@gem-imaging.com

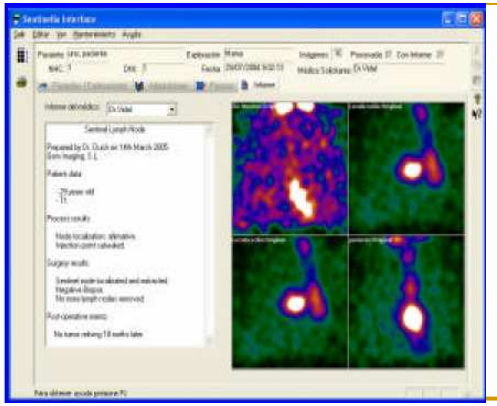
SENTINELLA 102

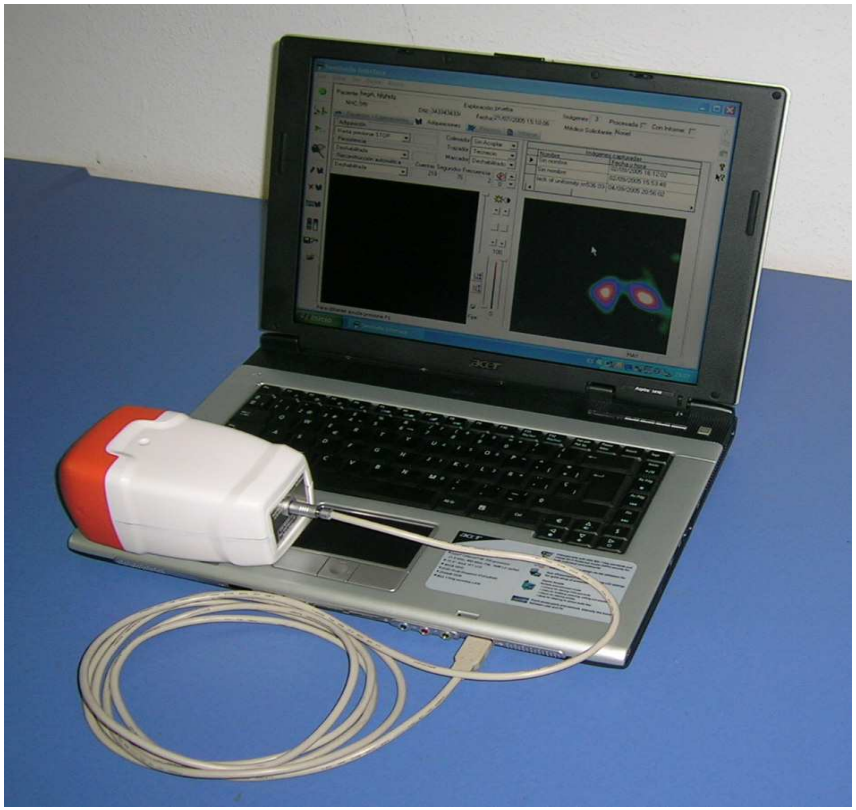
- ✓ Peso: 1 Kg
- ✓ Dimensiones: 15x8x9 cm

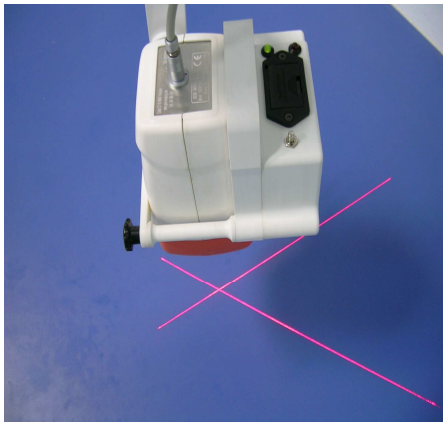
- ✓ Colimador pin-hole alta resolución
- ✓ Sensibilidad: 200-2000 cpm / µCi a 10 mm
- ✓ ^{99m}TC-sestamibi: 111-185 MBq (3-5 mCi) → 1/5-7 Dosis Dº Dosis=MIRP
- ✓ Energía radioisótopo: 50-200KeV

- ✓ Imágenes tiempo real (30'')
- ✓ Distancia ± 5 cm, LASER positioning system
- ✓ Conexión USB / Software específico compatible Windows







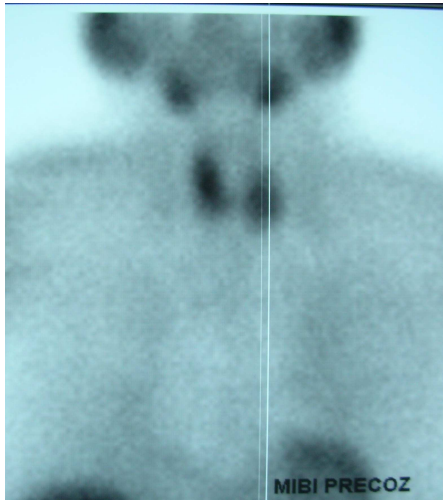


SENTINELLA 102

HIPERPARATIROIDISMO 1º (n=5)

- ✓ Ca^{++} > 10.5 mg/dL / PTH > 72 pg/mL
- ✓ Dº: gammagrafía doble fase ^{99m}TC-sestamibi
  - 4: gammagrafía sustracción ^{99m}TC-pertecnectato
  - 1: SPECT
  - Sensibilidad (lado afecto): 5/5 (100%)
  - Sensibilidad (gl afecta): 3/5 (60 %)

- ✓ Navigator GPS, 11mm: regla 20%
- ✓ PTH io (Roche Diagnosis, Alemania): regla 50%
- ✓ Confirmación histológica por congelación
- ✓ Incisión ± 2 cm, central, lentes aumento x2.5
- ✓ Alta 24 horas (Ca^{++} oral)
- ✓ Seguimiento 3 meses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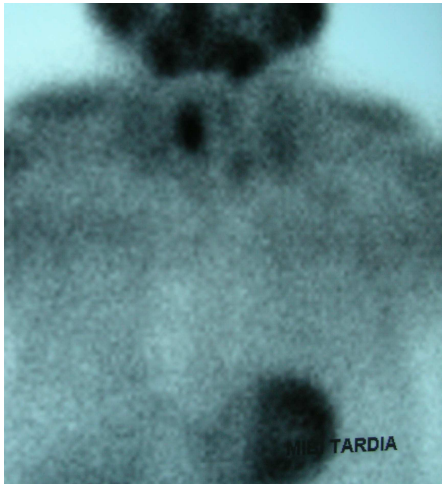
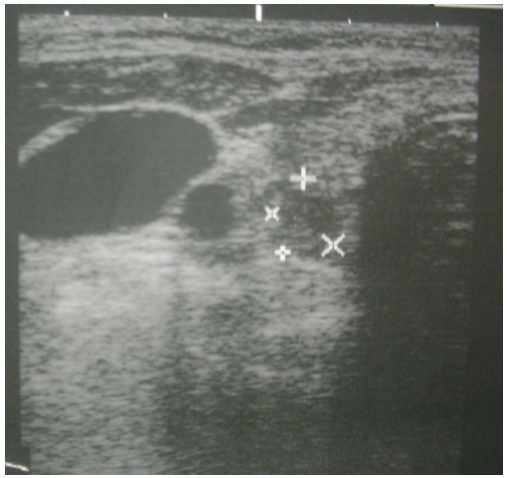
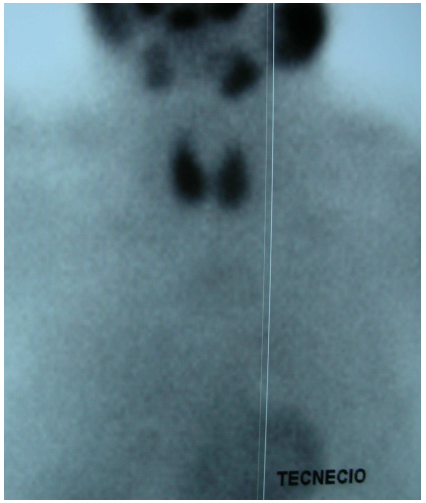
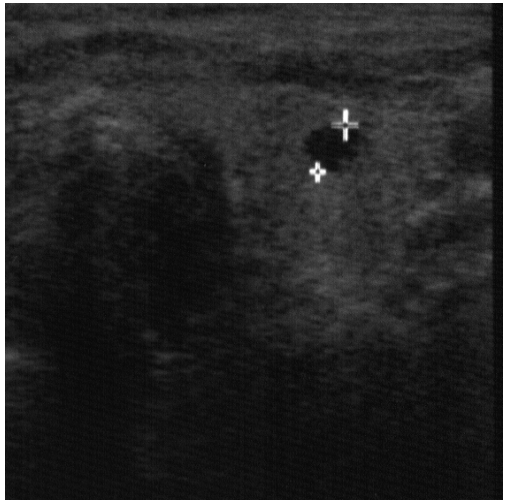
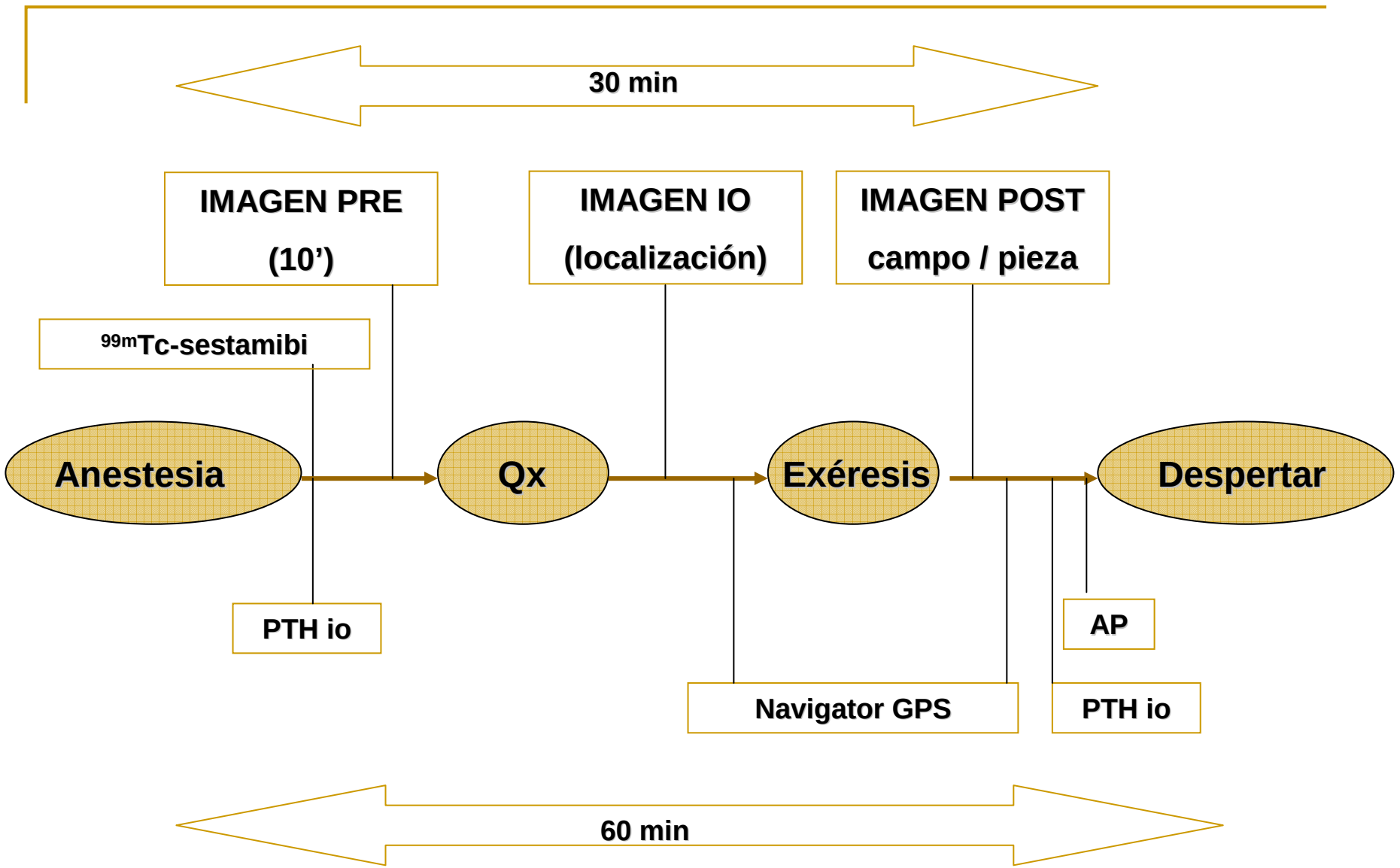

TARDIA




TECNECIO


STRACCION

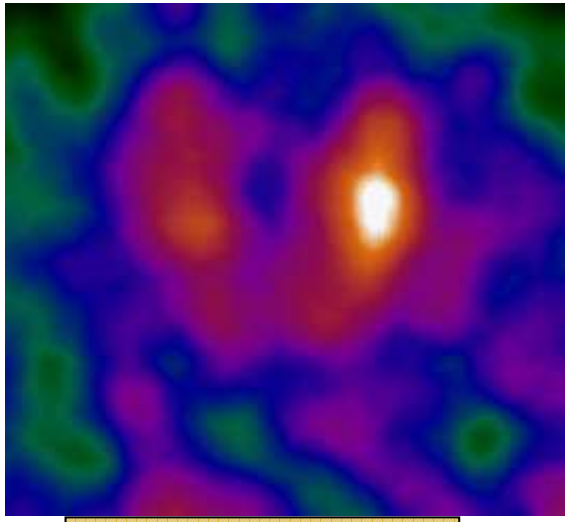



30 min
IMAGEN PRE
(10')
IMAGEN IO
(localización)
IMAGEN POST
campo / pieza
99mTc-sestamibi
Anestesia
Qx
Exéresis
Despertar
PTH io
AP
Navigator GPS
PTH io
60 min

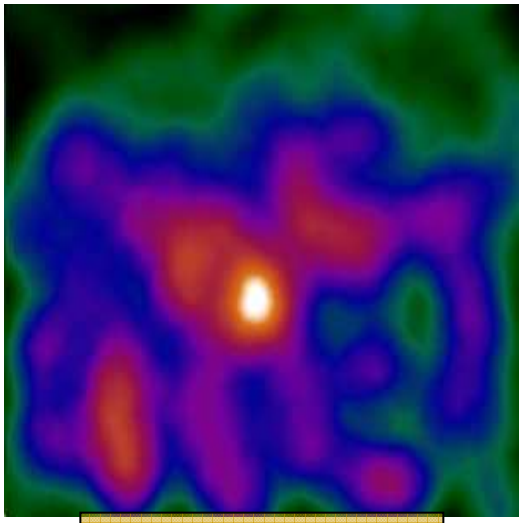
PRE

INTRA

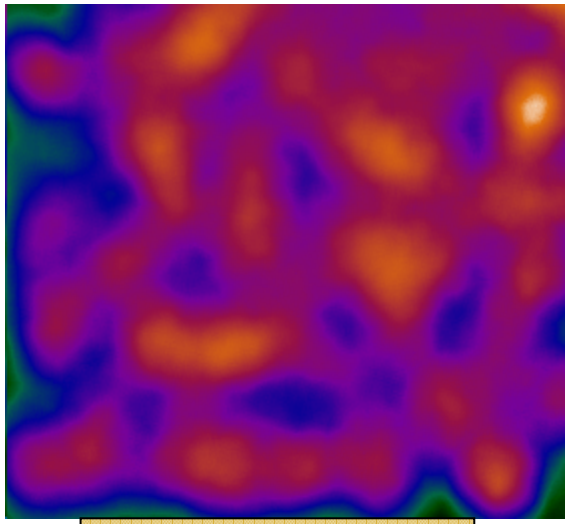
POST



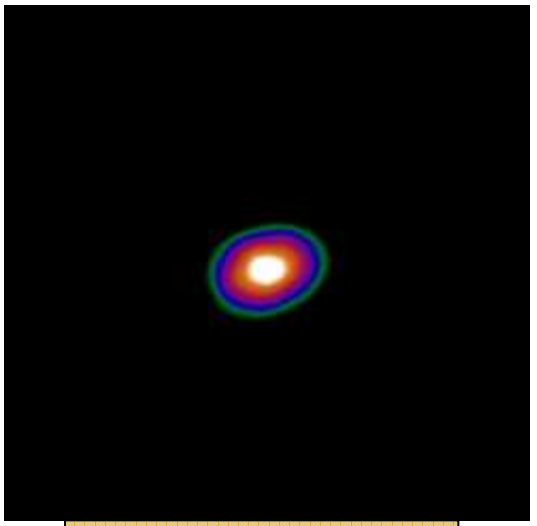
PRE-EXTRACCIÓN



LATERAL



POST-EXTRACCIÓN



POST-EXTRACCIÓN

Parameter	#1	#2	#3	#4	#5
Age (yr)	65	59	60	44	63
Ca pre (mg/dl)	10,9	10,9	11,7	10,7	11,5
PTH pre (pg/ml)	173	120	297	156	163
ioPTH 1 (pg/ml)	306	220	265	217	289
ioPTH 2 (pg/ml)	60	53	26	41	63
Ca po (mg/dl)	9,3	8,9	8,2	9,8	8,7
PTH po (pg/ml)	73	85	96	83	81
Tumor size (cm)	2,3x1,8	2,5x1,5	2,2x1,2	2,5x1,0	2,0x1,0
Operative time (min)	60	100	60	60	60

The preop values were determined one month before the operation
The ioPTH sample 1 was taken intraoperatively after anaesthesia induction
The ioPTH sample 2 was taken intraoperatively 10-15 minutes after adenoma resection
The postop values were determined 3 months postoperatively

RESULTADOS PRELIMINARES

Requisitos:

- Sentinella 102
- Servicio Medicina Nuclear

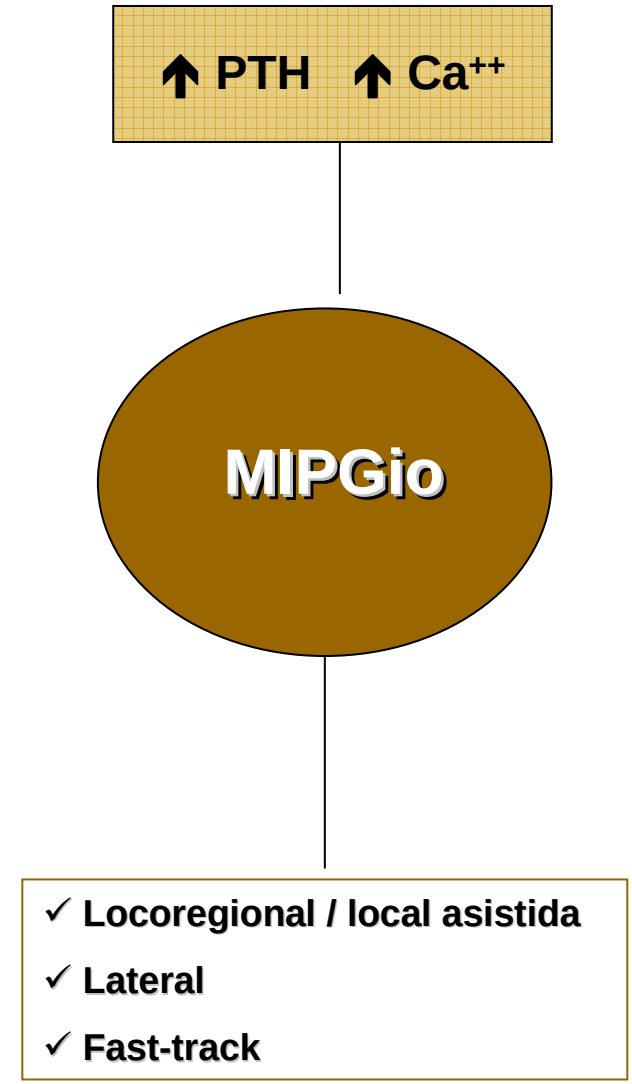
Ventajas:

- Localización (MIRP) + confirmación (PTHio)
- Eliminar localización preoperatoria ?
- Menor tiempo operatorio
- Ectopias / Dobles adenomas ?

Coste /efectivo

Hiperplasia?

HP recidivado (x2): gammagrafía io negativa


↑ PTH ↑ Ca++
MIPGio
✓ Locoregional / local asistida
✓ Lateral
✓ Fast-track