

OBJECTIVES

Evaluation of :

- Long Term Efficacy of High Intensity Focused Ultrasound (HIFU) Cyclocoagulation
- Side effects and tolerance

MATERIALS & METHODS

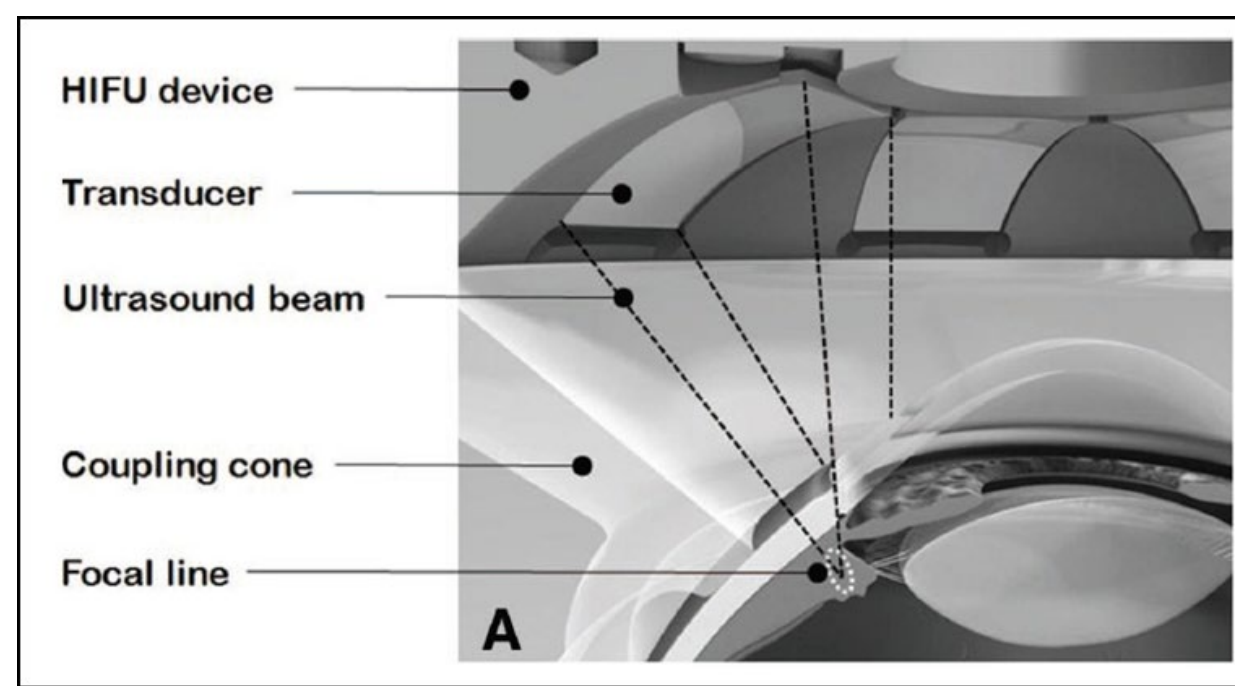


Figure 1:
The HIFU device is composed of 2 parts (probe + cone coupling): the ultrasound beam is focused in the ciliary body (dotted lines).

- 6 miniaturized cylindrical piezoelectric transducers
- Ring focal zones : 11 mm, 12 mm or 13 mm
- Surface of ciliary processes treated = 40% of the circumference

PROCEDURE UCP



Figure 2:
Procedure: The coupling cone is placed directly in contact with the eye with good centering (left). The probe is inserted into the cone which must be filled with saline solution before starting treatment. The 6 transducers are activated with an exposure time of 8 seconds for each sector

- Tracking of the position of the ciliary processes (UBM, OCT, biometric data)
- UCP procedure in the operating room
- TTT parameters: 6 zones, 8 seconds / transducer
- Maintain the hypotensive eye drops for at least the first 2 months after procedure
- Anti-inflammatory treatment systematically given during 1 month (corticosteroids)
- Measurement of IOP: D7-M1-M3-M6-M12-M24-M36

EVALUATION CRITERIA

- IOP decrease > 20% compared with baseline IOP, without added hypotensive treatment, and IOP > 5 mmHg
- Per and post-operative complications

POPULATION

Tableau 1 : Characteristics of the population

Characteristics	Total (n=104)
Age (years): average (SD) [Min-Max]	65,5 (16.2) [8-92]
Genre (Male/female) (%)	57 / 47
Lens (Phakic /Pseudophakic/ Aphakic)	41% / 49% / 9%
Typology of glaucoma	
- Primary open angle	60 (58%)
- Pigmentary	4 (4%)
- Pseudo-exfoliative	3 (3%)
- Closed angle	2 (2%)
- Secondary	25 (24%)
- Not specified	7 (7%)
Surgical history of glaucoma	
- Trabeculectomy	27 (26%)
- Non-perforating deep sclerectomy	24 (23%)*
- Laser trabeculectomy	28%
- Cyclo-coagulation Diode laser	4%
Hypotensive eye drops: average (SD) [Min-Max]	3.0 (0.9) [0-5]
Systemic hypotensive treatments (% patients)	27%
HIFU treatment procedures	Apr-2015 to Dec-2015
- 1 treatment UCP	82 (79%)
- 2 treatments UCP	20 (19%)
- 3 treatments UCP	2 (2%)

* including 5 also having a trabeculectomy

EFFICACY

Overall population – Intraocular pressure follow-up

Table 2 : Evolution of IOP and hypotensive treatment

	Average IOP (mmHg)	n	Average reduction (%)	Hypotensive treatment
Baseline	27,6 ± 8,9	104	-	3,0
D7	15,4 ± 7,4	80	44%	3,2
M1	18,7 ± 8,9	79	31%	3,0
M3	20,1 ± 8,0	56	29%	3,2
M6	19,9 ± 7,6	60	27%	3,1
M12	18,2 ± 6,2	38	33%	3,4
M24	17,1 ± 7,0	38	33%	2,8
M36*	17,0 ± 6,8	53	33%	2,8

*Last follow-up (mean follow-up = 36 months [24-48])

Results at 3 years

Figure 3: Patient's follow-up

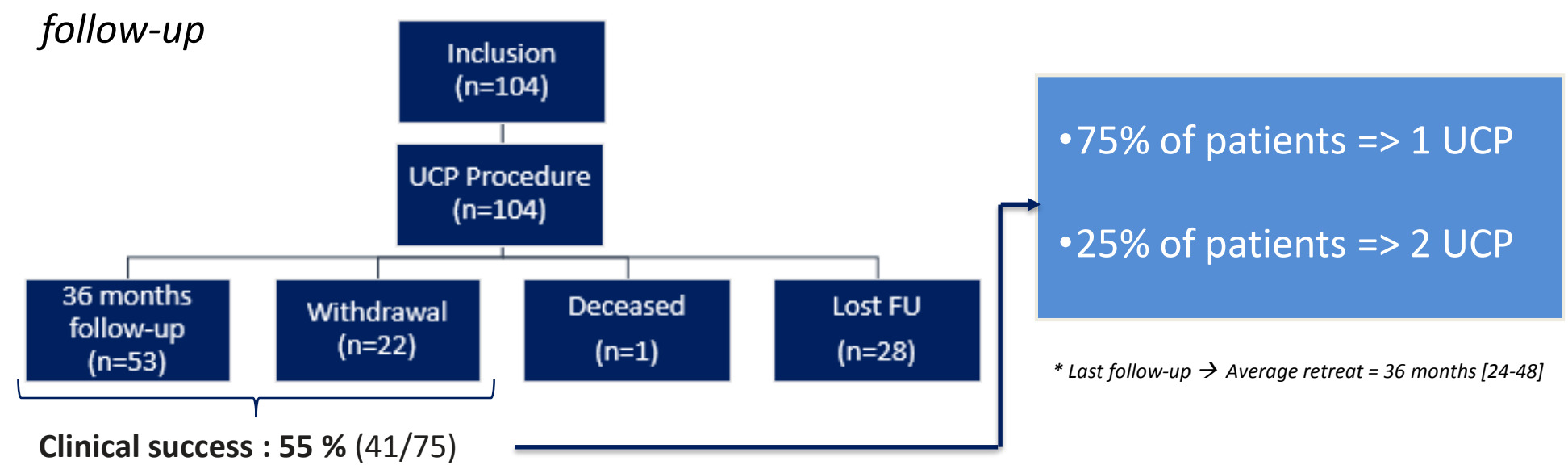
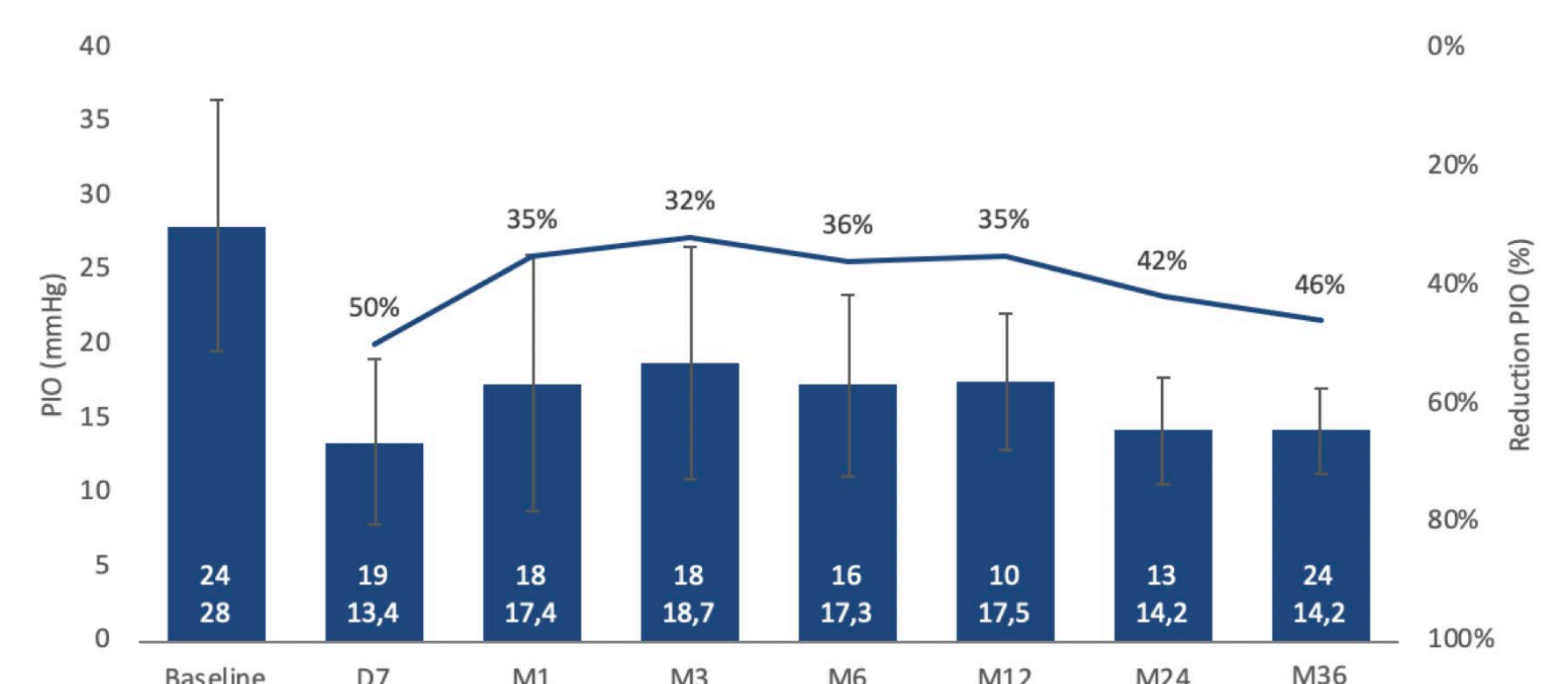


Table 3 : Evolution of the IOP of the patients in success at the visit to 3 years

	Average IOP (mmHg)	n	Average reduction (%)	Hypotensive treatment
Baseline	28,0 ± 8,4	24	-	3,3
D7	13,4 ± 5,6	19	50%	3,5
M1	17,4 ± 8,7	18	35%	3,0
M3	18,7 ± 7,8	18	32%	3,3
M6	17,3 ± 6,1	16	36%	3,2
M12	17,5 ± 4,5	10	35%	3,3
M24	14,2 ± 3,6	13	42%	2,3
M36*	14,2 ± 2,9	24	46%	2,4



At 3 years, mean IOP reduction = 46% associated with a mean decrease in hypotensive treatment (n = 3.3 to 2.4)

TOLERANCE

Table 4 : Complications

Complications	Total (n=104)
SKP	65 (63%)
Transient AC inflammation	42 (40%)
Hyperemia / Chemosis	31 (30%)
Mild Mydriasis	18 (17%)
Corneal edema	5 (5%)
Transient Hypertony (<1 month)	3 (3%)
Macular edema	3 (3%)
Transient Hypotony	2 (2%)
Transient hypotony with choroidal detachment	1 (1%)
Hypotony*	1 (1%)
Phtisis	0 (0%)

*appeared at 2.5 years post UCP

CONCLUSIONS

- UCP procedure is an effective and well-tolerated method in order to reduce intraocular pressure in patients with glaucoma
- At 3 years, 55% of patients are responders with a mean IOP decrease of 46%
- One UCP procedure for 75% of patients and a 2nd UCP procedure for 25% of patients