Clinicopathological characteristics, clinical outcome & prognostic factors for pituitary carcinomas: lessons from a systematic review of 207 cases

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CONTEXT: The evolution of a pituitary tumor towards a pituitary carcinoma (PC), defined by the appearance of metastases, remains difficult to predict. In addition, PCs are difficult to manage and have poor survival rates.

OBJECTIVE: to investigate the clinicopathological characteristics at the initial diagnosis of the pituitary tumor and at PC diagnosis, alongside with the management & outcomes of PCs, and to identify potential prognostic factors and therapeutic strategies associated with the clinical outcome.

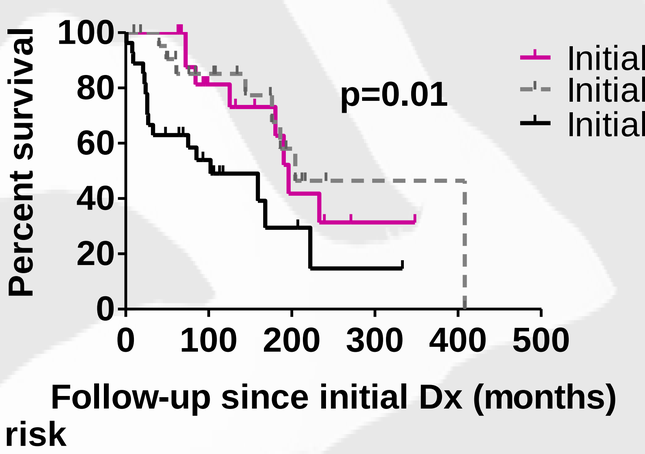
MATERIAL & METHODS: systematic review of all PC cases published up to May 2021.

RESULTS

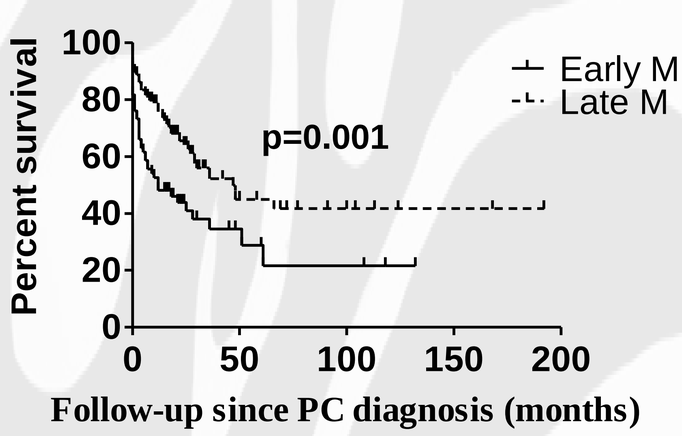
I. Clinicopathological characteristics of the 207 cases

Histological type (NA=22)	All N=207	Corticotroph N=78	Lactotroph N=59	Somatotroph N=24	Plurihormonal N=6	Null cell N=10	Gonadotroph N=8
Sex							
Male	108 (52.2%)	39 (50%)	37 (62.7%)	10 (41.7%)	2 (33.3%)	3 (30%)	5 (62.5%)
Female	99 (47.8%)	39 (50%)	22 (37.3%)	14 (58.3%)	4 (66.7%)	7 (70%)	3 (37.5%)
Dimension of the pituitary tumor at initial diagnosis (NA=67)							
<10mm	4 (2.86%)	2 (3.6%)	1 (2.3%)	0 (0%)	0 (0%)	1 (12.5%)	0 (0%)
≥10mm	136 (97.14%)	53 (96.4%)	42 (97.7%)	11 (100%)	5 (100%)	7 (87.5%)	8 (100%)
Invasion to the cavernous sinus at initial diagnosis (NA=164)							
Yes	39 (90.7%)	18 (85.7%)	10 (100%)	5 (100%)	NA	3 (75%)	2 (100%)
No	4 (9.3%)	3 (14.3%)	0 (0%)	0 (0%)		1 (25%)	0 (0%)
Localization of metastases (NA=6)							
Craniospinal	95 (47.26%)	25 (32.1%)	35 (66%)	9 (37.5%)	4 (66.7%)	4 (40%)	5 (62.5%)
Systemic	78 (38.8%)	42 (53.8%)	12 (22.6%)	13 (54.2%)	1 (16.7%)	3 (30%)	1 (12.5%)
Craniospinal + systemic	28 (13.93%)	11 (14.1%)	6 (11.3%)	2 (8.3%)	1 (16.7%)	3 (30%)	2 (25%)

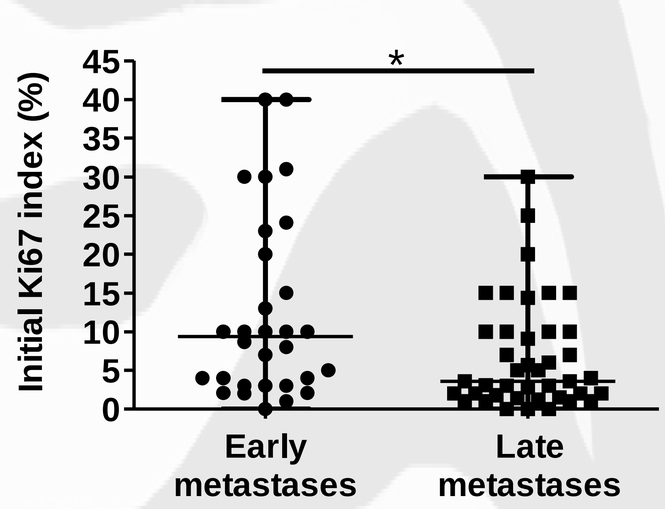
II. An initial Ki67 index ≥10% and early metastases (diagnosed at ≤60 months after the initial diagnosis) were associated with shorter survival



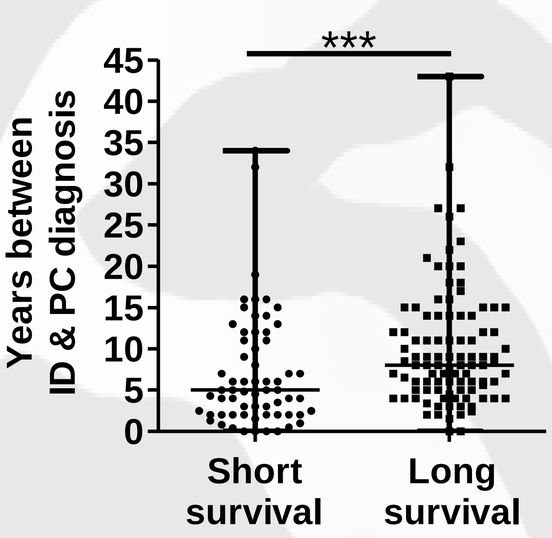
# at risk						
Ki67<3	19	10	4	1	0	0
Ki67 3-10	23	14	5	1	1	0
Ki67 ≥10	27	11	3	1	0	0

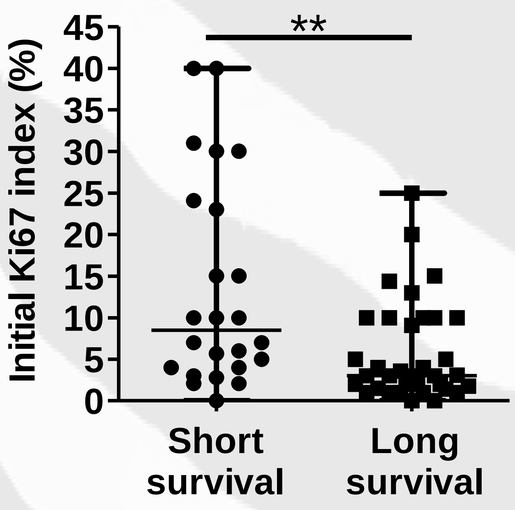


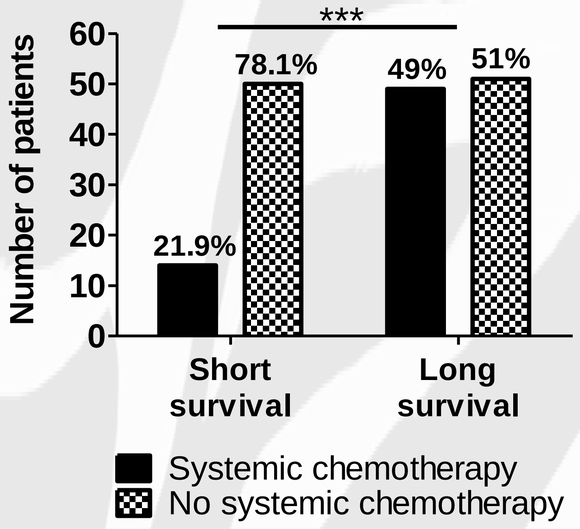
# at risk					
Early M	71	6	3	0	0
Late M	116	16	6	2	0

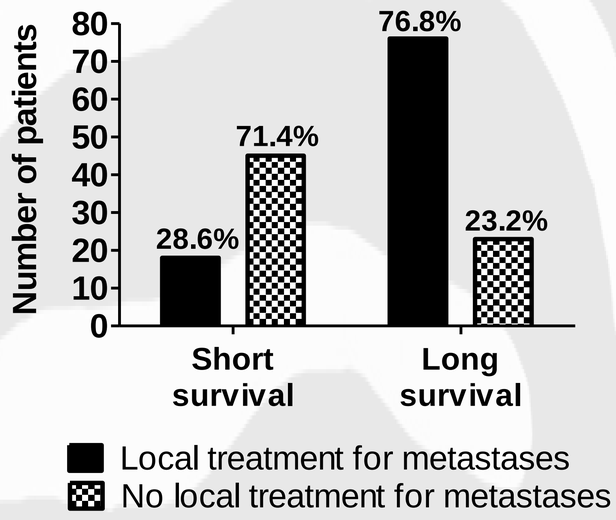


III. Short survival (survival after PC diagnosis ≤12 months) versus long survival (survival after PC diagnosis >12 months)









- short survival was associated with a shorter time between the initial diagnosis (ID) and PC diagnosis & with higher initial Ki67 index
- cases with long survival had received more frequently systemic chemotherapy, including temozolomide, as well as local treatment for metastases

CONCLUSION

A Ki67 index ≥10% is associated with a poor prognosis, i.e., with early metastasis and a shorter survival. Its presence should lead to an intensified surveillance and to a more timely management, which will hopefully result in better outcomes for these patients.

Not only systemic chemotherapy/temozolomide is associated with longer survival, but also the local treatment of metastases.