

PITUITARY MICROADENOMA IN CHILDHOOD - IS FOLLOW-UP WITH DIAGNOSTIC IMAGING NECESSARY?

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INTRODUCTION

Increased use of MRI and improved technique provides the opportunity to detect small pituitary lesions. In a few studies performed only in children there were no cases with further growth of microadenoma during repeated MRI (1-4). There is no consensus on recommendations of the optimal clinical and radiological follow-up of a microadenoma in children.

AIM

We aimed to investigate the growth potential of pituitary microadenoma and cystic lesion <10mm in children, and to evaluate how reproducible the measurements were on magnetic resonance imaging (MRI).

METHOD

Children included were under 18 years at first pituitary MRI, diagnosed with a microadenoma (microadenoma producing ACTH, GH or TSH excluded) or cyst < 10mm. Children with prolactinoma were included for testing of measurement accuracy. Pituitary lesion size at first and last MRI was reviewed by a neuroradiologist. All individual MRI examinations were re-evaluated by two radiologists.

RESULTS

In all, 74 children had a non-functioning microadenoma, probable microadenoma (a solid lesion less distinct) or cystic lesion, median age 12 years (range 3 – 17). Of those 55 underwent repeated MRI, median number 3 (range 2 – 7), with a median follow-up time of 37 months (range 4 – 189). An additional 12 children with prolactinoma, median age 16 years (range 12 – 17), underwent repeated MRI, median number 5.5 (range 2 – 11), median follow-up time 73.5 months (range 26 – 120). In one child the cystic lesion grew and hormonal deficits developed, in another child a prolactinoma increased in size due to problems with compliance to medication. None of the non-functioning microadenoma, probable microadenoma or cyst increased significantly in size during follow-up. Two reviewers agreed that no lesion could be identified in 38/269 MRI exams, in 51/231 (22%) there was disagreement about lesion location. They also disagreed in 34/460 (7%) MRI measurements to an extent that would have been considered progression in lesion size (>2mm). The inter-observer agreement was less accurate with the high field strength (3T), especially for probable microadenoma.

Table 1. Demographics, number of MRI scans and follow up time in children with pituitary microadenoma (including probable), cystic lesion and prolactinoma.

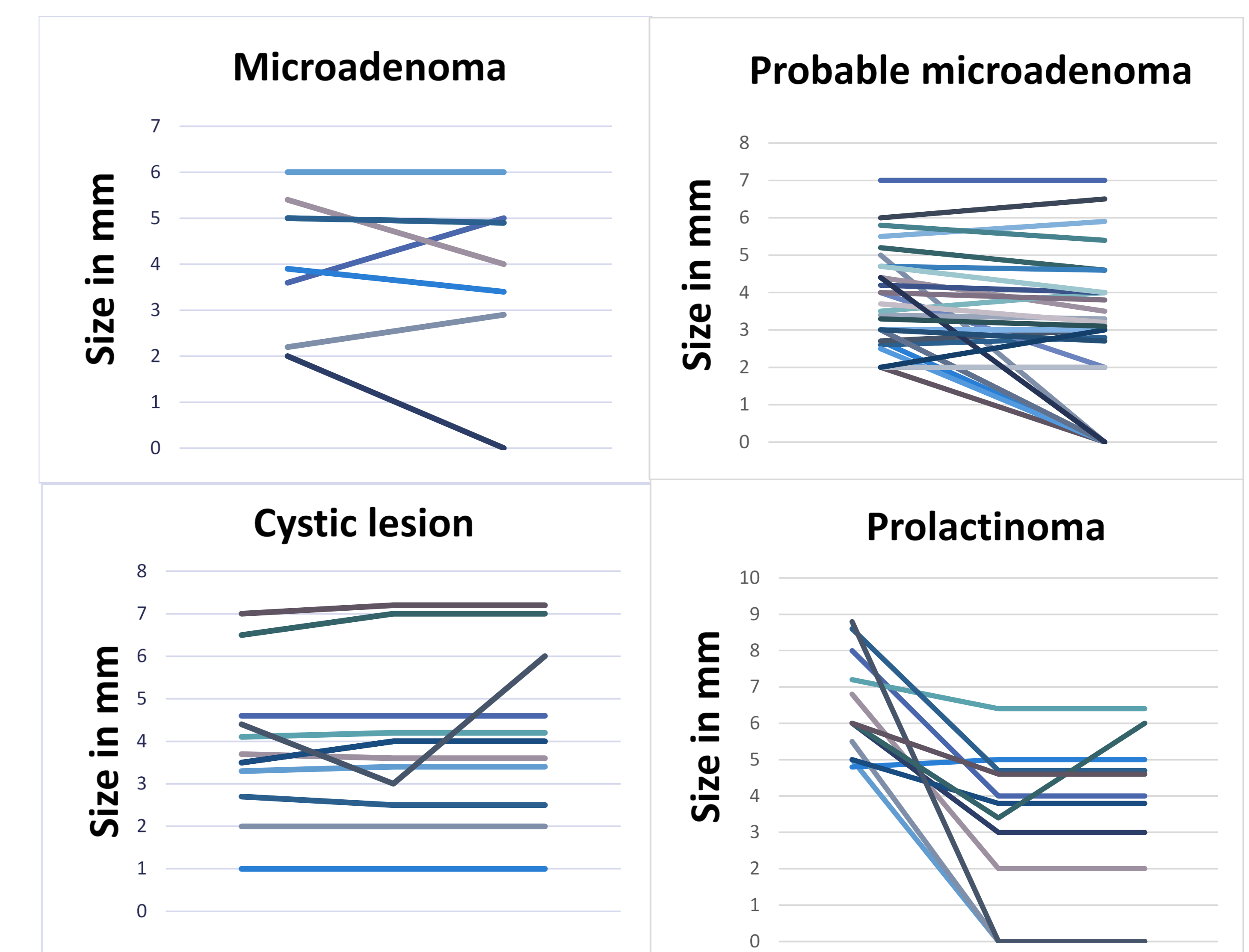
	Microadenoma (including probable) and cystic lesion n=74	Prolactinoma n=12
Age at first MRI scan median (range), years	12 (3-17)	16 (12-17)
Females, n (%)	43 (58%)	8 (67%)
Pubertal, n (%)	48(65%)	12 (100%)
Ophthalmological examination, n (%)	4(5%)*	7 (58%)*
Operation, n (%)	1 (1%)	1 (8%)
Hormone treatment, n (%)	32 (43%)	12 (100%)
Number of MRI scans median (range)	2 (1-7)	5.5 (2-11)
Follow-up time, median (range), months	37 (4-189)**	73.5 (26-120)

*Normal result of ophthalmological examination in all cases. **For those 55 with repeated MRI

Table 2. Presenting symptoms pituitary microadenoma (including probable) and cystic lesion.

Presenting symptom	n = 74	%
Precocious puberty	27	36
Growth disturbances	22	30
Delayed puberty	7	9
Headache	5	7
Fatigue	3	4
Pubertal arrest	3	4
Pituitary insufficiency	2	3
Ptosis	1	1
Stereotype movements	1	1
Focal epilepsy	1	1
Hyperprolactinemia (risperidone)	1	1
Secondary amenorrhea	1	1

Figure 1. Size at initial and last MRI, as measured by an experienced neuroradiologist, for non-functioning pituitary microadenoma (n=8), probable microadenoma (n=35), cystic lesion (n=12), prolactinoma (n=12).



CONCLUSIONS

Non-functioning pituitary microadenoma or cystic lesion in children, with no hormonal disturbances, show small clinically irrelevant size variations that do not require intervention or extended follow-up. We suggest for smaller pituitary lesions < 4 mm no regular MRI follow up, and for lesions 4-9 mm a follow up MRI after 24 months, since there still is limited knowledge of the natural cause and risk of long term growth in these conditions.

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