



## CLINICAL STUDY

# IS THERE ANY EFFECT OF ADENOTONSILLECTOMY ON GROWTH?

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### SUMMARY

**Aim:** To assess the effect of adenotonsillectomy for percentiles (on growth) on long times.

**Materials and Methods:** 36 boy and 24 girl underwent adenotonsillectomy when they were between 3.5 and 6 years in our clinic. Pre-operative families received weight and height measurements were taken, calculated percentiles. After 7 years we could achieved 49 patients and they were 31 boys and 18 girls, measured weight and height than calculated percentiles. The change in percentiles was compared.

**Results:** Children with adenotonsillectomy have a percentile increase in weight in both boys and girls. Height percentile increased in boys but height percentile was the same in girls.

**Discussion:** Adenotonsillectomy resulted as an increase in weight percentile for long-term follow up but there was a significant increase in percentiles in boys and no change in girls.

**Keywords:** Adenotonsillectomy, percentile, length, weight

### ADENOTONSİLLEKTOMİNİN BÜYÜME ÜZERİNE ETKİSİ NEDİR?

#### ÖZET

**Amaç:** Adenotonsillektominin persantil (büyüme) üzerine uzun süreli etkisinin değerlendirilmesi.

**Materyal ve Metod:** Kliniğimizde yaşları 3.5-6 arasında değişen 36 erkek ve 24 kız çocuğa adenotonsillektomi uygulandı. Operasyon öncesi çocukların boy ve kiloları ölçüldü, persantilleri hesaplandı. 7 yıl sonra 31 erkek ve 18 kız olmak üzere 49 hastaya ulaşıldı. Boy ve kiloları ölçüldü, persantil değerleri hesaplandı. Persantillerindeki değişim karşılaştırıldı.

**Sonuçlar:** Adenotonsillektomili hem erkek hem de kız çocuklarında ağırlık olarak persantil artışı mevcuttu. Erkeklerde boy persantilleri artarken, kızlarda boy persantilleri aynıydı.

**Tartışma:** Adenotonsillektomi, uzun dönem takiplerde ağırlık persentilinde artış ile sonuçlanmıştır ancak boy persantillerde erkeklerde anlamlı bir artış olurken, kızlarda ise değişiklik olmamıştır.

**Anahtar Sözcükler:** Adenotonsillektomi, persantil, boy, ağırlık

## INTRODUCTION

Adenoidectomy and tonsillectomy are common operations in childhood. Adenotonsillectomy (AT) is a treatment option for adenotonsillar hypertrophy (ATH) and recurrent tonsillitis.<sup>1</sup> Definitive indications of adenotonsillectomy includes ATH, obstructive sleep apnea, aberrant dentofacial growth, suspicion of malignancy. AT is usually performed for recurrent throat infections and their associated consequences.<sup>2</sup> There are lots of proven significant benefits of AT, as well as potential complications from surgical intervention including throat pain, feeding

problems, postoperative nausea and vomiting, hemorrhage and even rarely death.<sup>3,4</sup> Reduced dietary intake and inability to gain weight in patients with recurrent episodes of acute tonsillitis are frequently raised by families.<sup>5</sup> Low caloric intake, increased energy requirement, difficulty in breathing, hypoxemia and growth hormone, insulin like growth factor-1 secretion interrupted in patients with ATH.<sup>6</sup> Lots of retrospective studies reported a significant increase in Body Mass Index (BMI) percentile after AT, particularly in children younger than 6 years, although no significant increase in rates of obesity was observed.<sup>1,7</sup>

The aim of this study is to assess the effect of adenotonsillectomy on growth of children (weight-height) and to find out the changes in growth and development percentiles.

## MATERIAL and METHODS

Adenotonsillectomy was performed to 60 children aged between 3.5 and 6 years in our clinic between 2011 and 2012 years. 36 of the

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patients were boys and 24 girls. Our study has been verified by Firat University Scientific Research and Publication Ethics Committee. Children with asthma, allergic rhinitis and chronic disease were excluded from the study. Pre-operative height and weight measurements were obtained by obtaining consent from the parents of patients. At the end of 7 years, 49 patients (18 female and 31 male) were reached. None of the patients received nutritional supplements or dietary restrictions during this period. Patients who could not be reached were excluded from the study. Pre-operative weight and weight percentiles were calculated according to the age of the patients. We used Length World Health Organization percentiles schedule for calculate length Percentiles.<sup>8</sup> According to this schedule:

1. Percentiles : The growing is very very bad and must be investigated

1-3. Percentiles : The growing is very bad and must be investigated

3-15. Percentiles : The growing is mildly poorly, searchable.

15-97. Percentiles : The growing is normal

97-100. Percentiles: The growing is too much and must be investigated

However, over 10 years weight percentiles did not given by World Health Organization (WHO) so we used for weight percentile which use routine in Turkey and it is reported by Olcay Neyzi at all. in 2008.<sup>9</sup> It is percentile schedule which use in Turkey. BMI evaluation could not be evaluated because BMI was not included in the BMI assessment for children under 5 years of age by WHO. So we used height percentiles by WHO percentiles Schedule and weight percentiles with local percentiles in Turkey by Olcay Neyzi percentiles Schedule.

The data were analyzed by SPSS software and Wilcoxon test and t-test has been used for statistical analysis.

## RESULTS

Pre-operative; The mean length of the boys were  $106,1 \pm 119,7$  and the mean weight was  $16,9 \pm 23,5$  average height and weight percentiles correspond to 50-75 percentile range.

Pre-operative; The mean length of the girls were  $98,6 \pm 118,2$  and the mean weight was  $14,3 \pm 22,7$  average height and weight percentiles correspond to 50-75 percentile range.

Post-operative 7th Years; The mean length of the boys were  $149,3 \pm 163,6$  and the mean weight was  $46,5 \pm 59,4$  average height and weight percentiles correspond to 75-85 percentile range.

Pre-operative 7th Years; the mean length of the girls were  $141,5 \pm 157,5$  and the mean weight was  $37,1 \pm 46,9$  average height and weight percentiles correspond to 75-90 percentile range.

The percentile changes of the patients before the operation and the 7th year after the operation, height percentiles calculated with WHO schedule and weight percentiles calculated with Turkey Local percentiles are shown in table 1 and table 2.

The level of development of the patients according to the percentiles growing stages is summarized in table 3 and table 4.

The preoperative percentile values of the patients and the percentile values calculated at the 7th postoperative year were compared. There was a statistically significant difference in weight percentile change after AT in both boys and girls ( $p < 0.05$ ), in the evaluation of height percentiles, there was a significant difference in boys ( $p < 0.05$ ), and there is no statistically significant difference was observed in girls.



**Table 1.** Height percentiles with WHO schedule.

Percentile Height	Girls (n=18)		Boys (n=31)	
	Pre-op	Post-op 7th years	Pre-op	Post-op 7th years
< 1	0	0	1	0
1-3	0	0	1	0
3-5	0	0	2	0
5-15	3	1	1	0
15-25	1	1	3	3
25-50	5	3	6	4
50-75	4	4	4	9
75-85	2	6	2	4
85-95	2	3	9	7
95-97	0	0	2	3
97-99	0	0	0	1
99 >	1	0	0	0

Pre-op: Pre-operative, Post-op: Post-operative



**Table 2.** Weight percentiles with Olcay Neyzi schedule.

Percentile Weight	Girls (n=18)		Boys (n=31)	
	Pre-op	Post-op 7th years	Pre-op	Post-op 7th years
< 3	0	0	0	0
3-10	0	0	2	0
10-25	3	0	4	0
25-50	7	2	11	7
50-75	2	7	6	6
75-90	5	6	6	10
90-97	0	3	1	6
97 >	1	0	1	2

Pre-op: Pre-operative, Post-op: Post-operative

**Table 3.** Height percentiles changes

	Girls (n=18)		Boys (n=31)	
	Pre-op/Post-op 7th years	Pre-op/Post-op 7th years	Pre-op/Post-op 7th years	Pre-op/Post-op 7th years
The growing is very bad	0	0	4	0
The growing is mild bad	3	1	2	0
The growing is normal	14	17	25	30
The growing is very well	1	0	0	1

Pre-op: Pre-operative, Post-op: Post-operative



**Table 4.** Weight percentiles changes.

	Girls (n=18)		Boys (n=33)	
	Pre-op/Post-op	7th years	Pre-op/Post-op	7th years
The growing is very bad	0	0	4	0
The growing is mild bad	4	1	4	3
The growing is normal	13	17	21	24
The growing is very well	1	0	2	4

Pre-op: Pre-operative, Post-op: Post-operative

## DISCUSSION

Most of the childhood TA are performed to reduce obstruction from enlarged tonsils or to treat recurrent infections, or both.<sup>10</sup> There is evidence that tonsillectomy is associated with weight increase and may contribute to pediatric obesity. The studies also showed substantial weight gain, not only in underweight children, but also in normal weight and overweight children who had undergone tonsillectomy. Accelerated weight gain after tonsillectomy, especially during the first year, has been reported in children.<sup>11,12</sup> Lots of recent studies emphasize the increased risk about weight gain in children who underwent tonsillectomy with or without adenoidectomy in the years after surgery.<sup>13</sup> In our study, there was a significant increase in weight values of both males and females as a percentile in the 7th year after the operation. At the end of 7 years, 2 children with a weight gain over 97 percentiles and one of them was already preoperative over 97 percentiles. Ersoy et al.<sup>4</sup> reported a significant increase in height and weight 1 year after tonsillectomy among children. They found a higher growth velocity and a higher concentration of insulin like growth factor binding protein-3 (IGFB-3) in the second 6-month period after the operation. In our study, there was a significant difference in the weight percentile increase in both boys and girls, while

in boys, there was a significant increase in height percent but no significant change in height percent in girls. Wijga et al. investigated the association of adenoidectomy and tonsillectomy with overweight in general population.<sup>13</sup> To gain more insight into the development of BMI after tonsillectomy with or without adenoidectomy, they assessed the development of relative weight, height, and BMI in the period from 2 years before surgery until 3 years thereafter in children who underwent AT. They concluded that children who undergo tonsillectomy with or without adenoidectomy are at increased risk to develop overweight in the years after surgery.<sup>14</sup>

According to our study results, there was a significant difference in weight percentile change in both boys and girls after AT. In the evaluation of the percentile, there was a significant difference in boys and no statistically significant difference was observed in girls. AT surgery has a positive effect on the development of children.

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