



Day-case adenotonsillectomy for sleep apnoea in children?



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ABSTRACT

Objectives: Many clinicians are concerned about possible airway or respiratory complications following adenotonsillectomy for sleep related breathing disorder (SRBD), and routinely admit such patients for overnight monitoring. However, published guidelines suggest this is unnecessary in some cases. This study firstly aimed to establish current UK practice, and secondly to investigate whether children with mild/moderate SRBD experience respiratory problems during the first post-operative night.

Methods: To establish current UK practice, we carried out a telephone survey asking if the procedure was carried out as a day-case, and admission criteria. For the second aim, a prospective study of children admitted following adenotonsillectomy for mild/moderate SRBD was carried out to investigate occurrence of respiratory complications on first post-operative night.

Results: Forty-two UK ENT doctors responded to the telephone survey, 50% routinely admitted patients having adenotonsillectomy for SRBD. Discharge criteria included stable observations and eating and drinking (14 hospitals), no bleeding (1), stable oxygen saturations (1) and age above 5 years (1); four had no specific criteria. Of 51 children admitted following adenotonsillectomy for mild/moderate SRBD, 11 (21.6%) experienced oxygen desaturations overnight. Of these, nine were under 4 years old, and two older children had asthma. Irrespective of comorbidities, 9/27 (33.2%) children under 4 years old experienced desaturations. The only children aged more than 4 years that had desaturations were ones that had additional comorbidities.

Conclusion: Half of surveyed doctors admit all children following surgery for SRBD. The number of admissions could be reduced, because same-day discharge for otherwise-healthy children over 4 years old having adenotonsillectomy for mild/moderate SRBD appears to be safe.

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1. Introduction

Sleep related breathing disorders (SRBD) are common in childhood. The condition may be caused by multiple factors but is typically a result of adenotonsillar hypertrophy. It affects between 2% and 4% of children and mainly occurs in children aged 1–8 years [1]. In a minority it can adversely affect neural sites in regions of the brain controlling important functions such as memory and cognition, and may be associated with several cardiovascular complications including cor pulmonale, cardiac failure and hypertension [1,2].

The main treatment is adenotonsillectomy. Due to concerns about possible post-operative airway problems or negative pressure pulmonary oedema, overnight inpatient care for all children having adenotonsillectomy for SRBD may be considered [3,4]. However, whether overnight admission is required or not is unclear, and there is a variation among institutions on admission or day-case criteria [5,6]. Recent French and USA guidelines indicate that admission is only required in select children, and a 2009 UK consensus document deemed day-case surgery acceptable [7]. Selective admission of only those patients deemed at increased risk of complications would avoid unnecessary admission for many children, resulting in significant cost benefits, and increased capacity for other admissions.

Our study had two aims. Firstly, to establish whether hospitals in UK are performing day-case adenotonsillectomy for SRBD. Secondly, to examine (in a hospital that admits all children for observation)

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whether children with mild to moderate SRBD experience respiratory problems on the first night post adenotonsillectomy. From the results, we aim to establish if same-day discharge is safe and UK practice should change.

2. Methods

2.1. Establishing current UK practice on admission post adenotonsillectomy for children with SRBD

A telephone survey was carried out, calling 65 out of approximately 125 hospitals providing an ENT service across the UK; the hospitals were chosen through convenience sampling. The ENT on call junior doctor or registrar were contacted, and asked if their institution carried out the procedure as a day-case, and if so what the criteria for same-day discharge was. The authors recognize that responses may be influenced by the familiarity of the on-call doctor with their hospital guidelines.

2.2. Complications on first post-operative night

Our institution routinely admits all children having adenotonsillectomy for SRBD for overnight monitoring with continuous pulse oximetry using Covidien Nellcor MAXN disposable probes. In order to establish whether admission was necessary, we studied data that are routinely collected as part of normal post-operative care. We included children aged between 2 and 13 years (inclusive) that had tonsillectomy or adenotonsillectomy for mild to moderate SRBD between February 2013 and March 2014; only those children having surgery on the days that the first two authors were in the hospital were included as this methodology allowed us to access the required data as part of normal patient care.

We chose to focus on those with mild/moderate SRBD as we felt that they were potentially suitable for day-case surgery in the future. Severity of SRBD was graded based on pre-operative at-home overnight pulse oximetry of at least 6 h scored according to the McGill criteria, using Visidown Software (Stowood Medical, Oxford, UK) analysed by a single observer who identified the artefact-free recording period and analysed the recording (Table 1). The use of sleep studies is not mandatory in the UK, but several consultants in our department routinely request oximetry in order to guide need for surgery and post-operative care; this provided a convenient way of grading SRBD severity for this study.

Ethical permission was not required as this study of service delivery observed normal clinical practice.

All surgical procedures were performed using cold steel technique, with ties and/or bipolar diathermy for haemostasis. All patients were given intraoperative dexamethasone. Data collected included age, other co-morbidities, and perioperative opioid analgesia. All overnight oxygen desaturations that were sustained below 94%, requiring either nursing (such as position change) or medical intervention (such as oxygen administration),

were identified from written clinical records. Sustained desaturations below 94% would normally prompt nursing or medical intervention. Any desaturations that were brief (seconds) would not be acted upon or recorded by the nursing staff, and would thus not be included in this study as they would be deemed to be of no clinical significance. Patients with significant medical co-morbidities leading to an ASA 3 or 4 were excluded.

3. Results

3.1. Current UK practice

The telephone survey included responses from 42 out of 65 hospitals contacted. The other hospitals were excluded because the doctor was not available for a telephone conversation (22 hospitals) or not willing to participate (1 hospital). Overall, 50% (21/42) of hospitals routinely admitted patients having adenotonsillectomy for SRBD. In those that performed day-case surgery, the main criterion for discharge cited was that the patient had stable observations and was eating and drinking (14 hospitals); other criteria included no bleeding (1 hospital), stable oxygen saturations (1 hospital) and age above 5 years (1 hospital), but four hospitals had no specific criteria for same-day discharge. Reasons for converting a planned day-case into an overnight stay were if the child was unwell, long duration of surgery, far distance from hospital, presence of comorbidities, afternoon surgery or surgery over the weekend.

3.2. Safety of same-day surgery

A total of 51 children (mean age 4 years, range 2–13) were admitted following adenotonsillectomy for mild/moderate SRBD at our institution. All apart from one child received perioperative opioid analgesia in the form of either morphine or fentanyl.

Eleven (21.6%) children experienced oxygen desaturations whilst asleep needing intervention, all of which improved with simple supplemental oxygen administration. In this group, nine were under 4 years old, and the other two had asthma. Irrespective of comorbidities, 9/27 (33.3%) children aged under 4 years old experienced desaturations. The only children aged more than 4 years that had desaturations were ones that had additional comorbidities (Table 2).

4. Discussion

Our study shows that half of UK hospitals surveyed may be performing day-case adenotonsillectomy for SRBD. In a hospital that currently admits all, the children experiencing desaturations following adenotonsillectomy for mild/moderate SRBD were those children that were either aged under 4 years old or had additional comorbidities. This suggests that it is possible to identify children at increased risk of airway complications, and that discharging

Table 1
Grading of SRBD severity based on overnight pulse oximetry [17].

SRBD severity	Baseline oxygen saturations	No. of drops <90%	No. of drops <85%	No. of drops <80%	Other criteria
Normal/inconclusive for OSA oximetry	Normal with mean saturation >92%	<3	0	0	<3 clusters of desaturations and saturations >95%
Mild SRBD	Clusters of desaturations (≥ 3) with increase in heart rate	≥ 3	≤ 3	0	Three or more clusters of desaturation events
Moderate SRBD	Clusters of desaturations (≥ 3) with increase in heart rate	≥ 3	>3	≤ 3	Three or more clusters of desaturation events
Severe SRBD	Clusters of desaturations (≥ 3) with increase in heart rate	≥ 3	>3	>3	Three or more clusters of desaturation events

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