Improving International Standards in Surgical and Procedural Training through Comparative Operative Log Growth Charts

Vannipa Vathanophas, M.D.*, Noel Jabbourb, M.D.**

**Department of Otorhinolaryngology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand, **Department of Otolaryngology, University of Pittsburgh, Pittsburgh, PA, USA.*

ABSTRACT

Objective: To use these growth charts to critically assess sufficiency of cases and parity of cases between residents, and to compare these growth charts to available international standards for minimum case numbers.

Methods: Operative Log Growth Charts were developed for key indicator procedures for graduating otolaryngology residents in 2012-2014 at a large teaching hospital in the capital city of a newly industrialized country. Comparisons were made between years of training and required minimum case numbers published by the ACGME RRC for Otolaryngology.

Results: Data was available to create 7 key indicator operative log growth charts to include all available data from 2012-2014 residents. These growth charts were used to assess growth in operative procedures for residents in the program compared to historical norms in the program. Graduating residents surpassed ACGME minimum case numbers in Bronchoscopy only and were below the minimum numbers for the other key indicators tested.

Conclusion: There is significant heterogeneity in the standards for otolaryngology training between countries. It is possible to develop program-specific and country-specific operative log growth charts.

Keywords: Minimum case numbers; key indicator cases; surgical education (Siriraj Med J 2018;70: 123-126)

INTRODUCTION

Anecdotally, there is significant variance in case exposure between training programs on an international level. However, little data exists to quantify such differences in otolaryngology training. While case numbers are not a proxy for quality of education, a minimum exposure to certain key procedures may serve as a necessary baseline target. In recent years, the ability to obtain the Accreditation Council for Graduate Medical Education (ACGME)[1] international standardization offers a step towards the development of a minimum international standard for residency training.

Programs interested in improving case exposure must meticulously document and analyze resident operative logs. We offer one method for documenting case exposure over time, similar to a pediatric growth chart. Comparison can be made to the minimum case numbers for otolaryngology residency training published by the ACGME.

This study addresses the comparative standard minimum operative case numbers from the ACGME to the operative log growth charts for general otolaryngology training at Siriraj Hospital Mahidol University for 2012-2014 graduating residents.

MATERIALS AND METHODS

The sample of this study included the data from the educational division of the department of

Correspondence to: Noel Jabbour
E-mail: JabbourN@chp.edu
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Otorhinolaryngology. This study included the operative log book of the residents who attended Otorhinolaryngology specialty residency training program in Siriraj Hospital, Thailand and graduated between 2012 and 2014 academic years. The permission to use the data was granted by the Department of Otorhinolaryngology, Faculty of Medicine Siriraj Hospital, Mahidol University. The data was collected regarding the total operative cases of residents in each year and divided by the number of residents per year to obtain an average case number for all available key indicator procedures by post-graduate year of training.

The Operative Log growth Charts[2] were graphed for each key indicator procedure using a curve of best fit and compared to the published minimum case numbers published by the ACGME for each procedure.

Key indicator data was available for Parotidectomy, Neck Dissection, Thyroidectomy, Mastoidectomy, Tympanoplasty, Endoscopic Sinus Surgery (Ethmoidectomy), and Bronchoscopy. Thus seven operative log growth chart graphs were developed.

In order to describe conditions between Thailand and US surgical education, the number of operative cases during residency training was used as an indicator of surgical case exposure. Seven graphs have been created to compare the operative cases between Thailand and the US program of residency training in seven main categories.

Statistical analysis

Analysis of data in the study involved a variety of descriptive and inferential statistics.

RESULTS

The seven graphs were made based on the data that was obtained in Siriraj Hospital, Thailand from 2012 to 2014 compared with the required minimum numbers of operative cases in the US 2014 retrieved from committee for Otolaryngologist by Operative Log Growth Charts.

On each Operative Log Growth Chart[3], the vertical axis represents the number of operative cases as primary surgeon or supervising surgeon, and the horizontal axis represents the post-graduate year of residency training. The average numbers of operative cases in each year of Siriraj Hospital residents were plotted for each of the three graduate classes (2012-2014). In comparison with the minimum cases for graduating residents in the US program, deficiencies in several key indicator procedures was readily noted (Figs 1-7). There was

TABLE 1. The required minimum cases of all Key Indicator Procedures for graduating residents US program, 2014.[1]

Category	Procedure	Min #
KEY INDICATOR: Head & Neck	Parotidectomy (all types)	15
	Neck Dissection (all types)	27
	Oral Cavity Resection	10
	Thyroid/Parathyroidectomy	22
KEY INDICATOR: Otology/Audiology	Tympanoplasty (all types)	17
	Mastoidectomy (all types)	15
	Stapedectomy/Ossiculoplasty	10
KEY INDICATOR: FPRS	Rhinoplasty (all types)	8
	Mandible/Midface Fractures	12
	Flaps and Grafts	20
KEY INDICATOR: General/Peds	Airway – Pediatric and Adult	20
	Congenital Neck Masses	7
	Ethmoidectomy	40
	Bronchoscopy	22

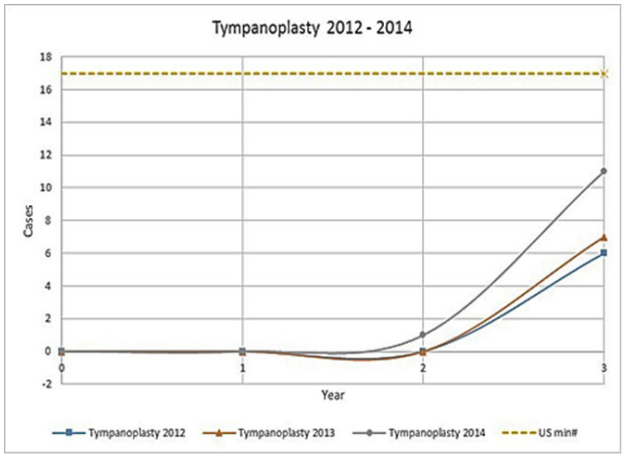
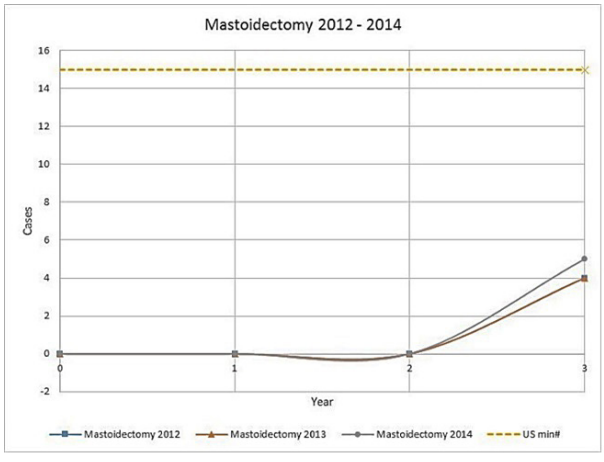


Fig 1.



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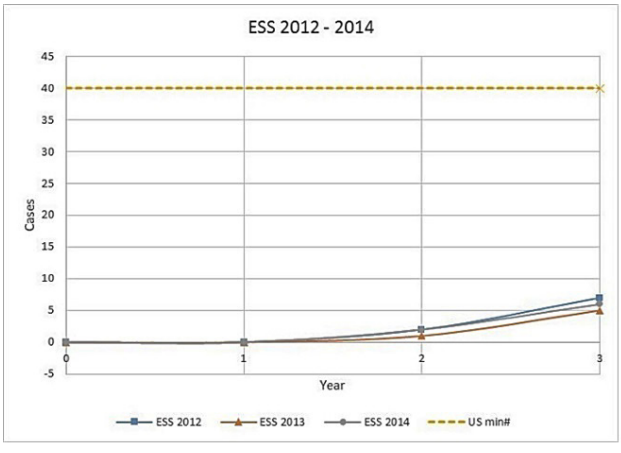

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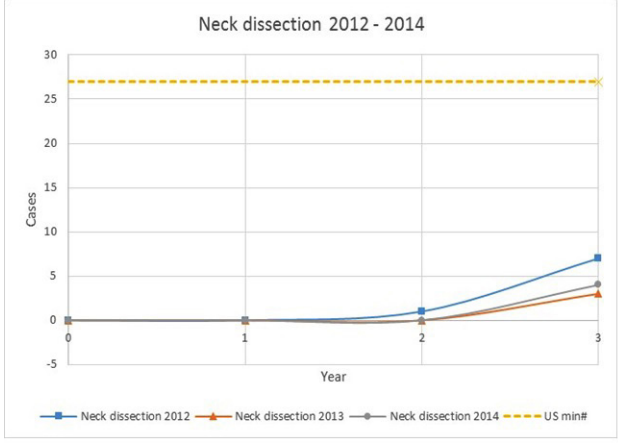

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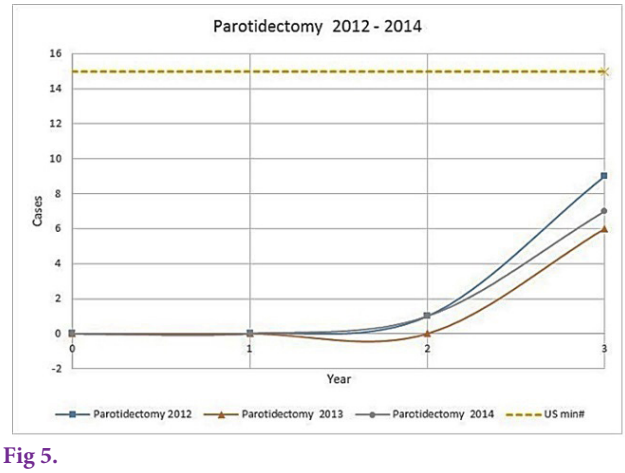

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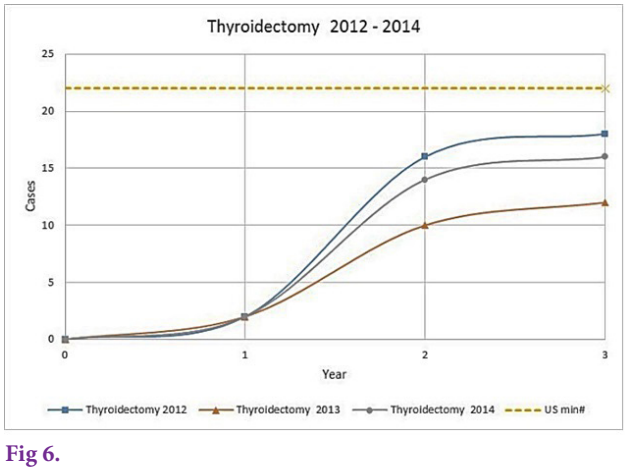

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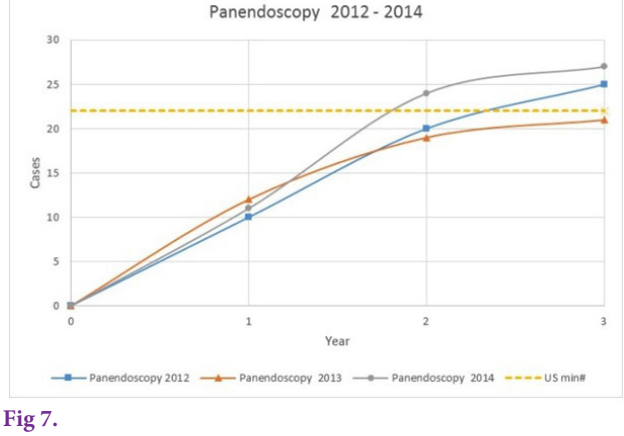

Fig 7.

Figs 1-7. The seven graphs were made based on the data that obtained in Siriraj Hospital, Thailand from 2012-2014 comparing with the required minimum numbers of operative cases in the US 2014 retrieving from committee for Otolaryngologist by Operative Log Growth Charts.

a lack of 6 cases in Tympanoplasty, 10 in Mastoidectomy, 34 in ESS, 20 in Neck Dissection, 6 in Parotidectomy, 4 in Thyroidectomy, and no difference in Bronchoscopy.

There were statistically significant differences between the operative cases of Siriraj Hospital medical school and the US program minimum in all key indicator cases except Bronchoscopy.

Examination of the mean and a one-sample t-test ($\alpha = .05$) indicated important differences between the operative cases of Siriraj Hospital medical school and the US program except for Panendoscopy (Bronchoscopy) category.

DISCSUSSION

Quantitative comparison of key indicator cases between international programs provides an essential starting point for improving international standards in otolaryngology training. Such a comparison provides an opportunity to consider methods for increasing case numbers, such as expanding the residency program to include other clinical sites or decreasing resident complement.

Developing program specific Operative Log Growth Charts may allow real-time monitoring of such changes. There is significant heterogeneity in the standards for otolaryngology training between countries. This project demonstrates that it is possible to develop program-specific and country-specific operative log growth charts.

While case exposure is not the equivalent of educational quality, a minimum exposure is essential for training. These growth charts may be used within a program to assess individual resident progress, to assess the effect of program changes such as training length and resident complement in real-time, and to compare case exposure to standards in other countries.

Partnerships between established programs in industrialized countries and those in newly industrialized countries may serve a valuable resource for both partners.

In addition to the monitoring of program changes, Operative Log Growth Charts may be used within a program to assess resident progress, parity of cases, and sufficiency of cases.

Similar growth chart comparisons may be made for other surgical specialties or medical specialties with minimum procedure numbers published by the ACGME.

CONCLUSION

Development of operative log growth charts allows for simple visualization of surgical case exposure over time. Comparisons can be made to historical experience within a program or to other national and international standards. We hope that this type of comparison may serve as a model for making program improvements on an international level.

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