



ORIGINAL ARTICLE

Otorhinolaryngology surgery analysis in Japan and Thailand: Comparing Nihon University School of Medicine with Thammasat University Faculty of Medicine



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Summary *Background/Objective:* We compared the surgery data of the department of otorhinolaryngology of the university hospitals in Japan and Thailand to make each feature and the differences of both otorhinolaryngology surgeries clear. There are some medical meetings and congresses between Japan and Thailand, but so far it has not reported about the comparison of surgery data.

Methods: Retrospectively, we analyzed the surgical statistics of department of otorhinolaryngology of Nihon University Itabashi Hospital (Japan) and Thammasat University Hospital (Thailand) between 2013 and 2014.

Results: In Japan, there were many surgeries involving the middle ear and paranasal sinuses

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whereas in Thailand, tracheotomy and tonsillectomy were more frequently performed. Statistical analysis of the surgical data revealed specific tendencies in the nature of the operations performed at each university.

Conclusion: This study revealed that there are rather differences between two hospitals' surgeries features. It was thought that it would be beneficial to both institutions to gain a deeper understanding of the areas of expertise of each university in order to foster an environment conducive to increasing future international collaborations.

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1. Introduction

In recent years, the rise of globalism among Asian countries has become particularly noteworthy as evidenced by the increasing numbers of Asian citizens traveling internationally for various purposes. International exchanges have also become more prominent in the field of medicine. Recently, Nihon University, one of Japan's most prestigious private universities, and Thammasat University, one of Thailand's most prestigious national universities, had an opportunity for international exchange and collaborative research. As yet, there are no reports that have examined surgical operation and disease statistics between Japan and Thailand in the field of otolaryngology. Therefore, we conducted this study for the purpose of elucidating any tendencies with respect to surgical methods and diseases in Japan as compared with those in Thailand. A further aim is to encourage international cooperation of surgical techniques and knowledge in the future.

2. Methods

The surgical cases in 2013 and 2014 in the Department of Otolaryngology-Head and Neck Surgery, Nihon University School of Medicine, Itabashi Hospital (hereinafter referred to as "Nihon Univ. ENT"), and Thammasat University Department of Otolaryngology, Thammasat University Hospital (hereinafter referred to as "Thammasat Univ. ENT"), were listed and compared. For both hospitals, only data from surgical cases performed in the operating room, not in outpatient or hospital rooms, were included in this study. The names of the surgical methods were divided into 42 types in accordance with the Annual Surgery Report of Nihon Univ. ENT. Both universities listed disease names of the indication and surgical procedures listed in the medical records. Then, the differences of the medical terminology between Japan and Thailand were discussed by doctors and integrated into the above procedures. For the number of operations, we calculated both percentage notation for the total number of operations and real notation for the case.

Nonparametric test was used for statistics. This research was approved at the Nihon University School of Medicine Itabashi Hospital Ethics Committee (approved number; RK-170314-10) and we underwent this research according to the ethic policy and the Declaration of Helsinki.

3. Results

Table 1 shows the breakdown of the number of surgical operations for both university ENT departments in 2013 and 2014. Table 1 is the total of 42 surgical operation types categorized into each area of ENT in accordance with the classification method of the Annual Surgery Report of Nihon Univ. ENT. In 2013 and 2014, the total number of operations at Nihon Univ. ENT was 500 and 521, respectively for a grand total of 1021. Similarly, totals at Thammasat Univ. ENT were 801 in 2013 and 802 in 2014 for a grand total of 1603 surgeries performed. Figs. 1 and 2 show graphs of the total numbers of surgeries in 2013 and 2014. Fig. 1 shows the percentage and Fig. 2 shows the actual numbers of surgeries. As for the statistical analysis, only the total difference of Category D was statistically significant ($p < 0.05$). However, examination and analysis of those data revealed a specific tendency in the numbers of operations at Nihon Univ. ENT and Thammasat Univ. ENT. Initially, the data show that surgeries in otology and rhinology are more frequently performed at Nihon Univ. ENT, whereas oropharynx, larynx, and the tracheal region surgeries are more frequently performed at Thammasat Univ. ENT. A more detailed examination of the 1st to the 10th categories of surgical procedures, in order of frequency, is shown in Table 2a–c. The 1st most frequent to the 3rd most frequent of them is shown in percentages in Fig. 3. As shown in Table 2a and b, the ranking in order of frequency of these operations, was the same both in percentages and in actual number of cases. Among the top three most frequently performed operations at each university, none overlapped with each other. The three most frequent surgery types performed at Nihon Univ. ENT were as follows: paranasal sinus surgery (endoscopic) 12.8% (131 cases), tympanoplasty 12.2% (125 cases), surgery of salivary gland tumor 7.0% (71 cases). Similar data for Thammasat Univ. ENT were as follows: tracheotomy 15.2% (244 cases), tonsillectomy 12.4% (199 cases), adenoidectomy 7.8% (125 cases). Adenoidectomy and neck dissection both held the 10th most frequent surgery type position at Nihon Univ. ENT.

Table 2c is aggregated data from each institution. This table shows the top 6 most frequently performed surgical procedures at both institutions. It is notable that among the top 3 surgeries from Nihon Univ. ENT, none of them overlapped with any of the top 3 performed at Thammasat Univ. ENT. Among the aggregated top 6 ranked surgeries, tracheotomy was ranked 1st (1st at Thammasat Univ. ENT), endoscopic paranasal sinus surgery was ranked 2nd (1st at

Table 1 Comparison of the surgery data of Nihon Univ. ENT and Thammasat Univ. ENT (2013 and 2014), *p < 0.05.

	Nihon Univ.	Thammasat Univ.
a) Otology		
1. Excision of preauricular sinus	13	7
2. Ventilation tube insertion	37	11
3. Repair of tympanic membrane perforation	0	0
4. Atticoantrotomy, mastoidectomy	68	15
5. Myringoplasty	22	12
6. Stapes surgery	3	4
7. Tympanoplasty	125	54
8. Facial nerve decompression	4	1
9. Surgery of otologic tumor	2	6
10. Cochlear implantation	1	0
11. Vestibular neurectomy	0	0
12. Others	5	13
<i>Sub total</i>	280 (1)	123 (1)
b) Rhinology		
1. Nasal polypotomy	3	9
2. Septoplasty	51	13
3. Turbinectomy	34	0
4. Radical sinus surgery	6	1
5. Extranasal sinus surgery (ethmoid sinus, sphenoid sinus, frontal sinus)	2	0
6. Paranasal sinus surgery (endoscopic)	131	60
7. Paranasal sinus surgery (non-endoscopic)	2	9
8. Surgery of paranasal sinus tumor	15	14
9. Cauterization of nasal mucosa (include laser)	5	37
10. Surgical correction of nasal fracture	1	0
11. Others	12	40
<i>Sub total</i>	262 (11)	183 (7)
c) Mouth, Epipharynx, Oropharynx		
1. Peritonsillar abscess drainage	15	3
2. Tonsillectomy	48	199
3. Adenoidectomy	28	125
4. Surgery of tongue tumor	6	27
5. Uvulopalatoplasty	0	6
6. Others	10	90
<i>Sub total</i>	107 (10)	450 (47)
d) Larynx, Trachea, Hypopharynx		
1. Tracheotomy	61	244
2. Endoscopic surgery		
i) Vocal cord polyp, vocal cord nodule	18	34
ii) Laryngeal tumor	36	68
iii) Hypopharynx tumor	13	17
3. Extraction of esophageal foreign body	0	30
4. Extraction of bronchial foreign body	0	1
5. Resection of laryngeal tumor, total laryngectomy	8	18
6. Pharyngectomy (incision)	9	3
7. Surgery for improving function of swallowing	1	0
8. Surgery for improving function of phonation	2	0
9. Others	8	79
<i>Sub total*</i>	156 (85)	494 (65)
e) Face, Neck, etc.		
1. Repair of alveolar cleft, cleft palate, cleft lip	0	0
2. Sialolithectomy (include submandibulectomy)	5	11
3. Surgery of ranula	1	2
4. Surgery of salivary gland tumor	71	36
5. Excision of cervical fistula, cervical cyst	8	14
6. Surgery of thyroid tumor	14	105
7. Neck dissection	28	53

(continued on next page)

Table 1 (continued)

	Nihon Univ.	Thammasat Univ.
8. Surgery of facial trauma (include maxillary fracture etc)	0	0
9. Others (ex. Lymph node biopsy)	89	132
<i>Sub total</i>	216 (83)	353 (80)
<i>Total number of surgical operation</i>	1021 (190)	1603 (200)

Numbers in brackets indicate malignant tumors.

Nihon Univ. ENT), tonsillectomy was ranked 3rd (2nd at Thammasat Univ. ENT), tympanoplasty was ranked 4th (2nd at Nihon Univ. ENT), adenoidectomy was ranked 5th (3rd at Thammasat Univ. ENT) and salivary gland tumor surgery was ranked 6th (3rd at Nihon Univ. ENT). Additionally, attic-otomy and mastoidectomy of the *a4* category are usually included within tympanoplasty of the *a7* category and therefore, were excluded from this table. The total number of malignant cases in each category is also listed in Table 1. More specific details with respect to these malignant cases were not included in this study due to the lack of clarity regarding such factors as biopsies and others.

4. Discussion

As a part of an international exchange of data between Nihon Univ. ENT and Thammasat Univ. ENT, we compared and analyzed the numbers of otolaryngology cases and surgeries at both university hospitals. Several international

academic society conferences from Asian countries have been held in the field of otolaryngology, but literature examining surgical statistics and surgical procedures in Japan and Thailand could not be found at the time of this study. This study is the first report comparing the otolaryngology field in a Japanese university and a Thailand university. There are many universities in both countries and the background is different in each university. Therefore, the data of each university does not represent the data of each country.

In 2013 and 2014, the number of surgeries at Nihon Univ. ENT was 1021, whereas the total at Thammasat Univ. ENT was 1603. However, Nihon University Itabashi Hospital has approximately 1000 beds, and Thammasat University Hospital has approximately 700 beds. We surmised that the reason the number of surgeries performed at Thammasat Univ. ENT was larger could be related to the differences of the locations and circumstances of the two hospitals. There are several big university hospitals and general hospitals in the Tokyo metropolitan area where Nihon Univ. ENT is

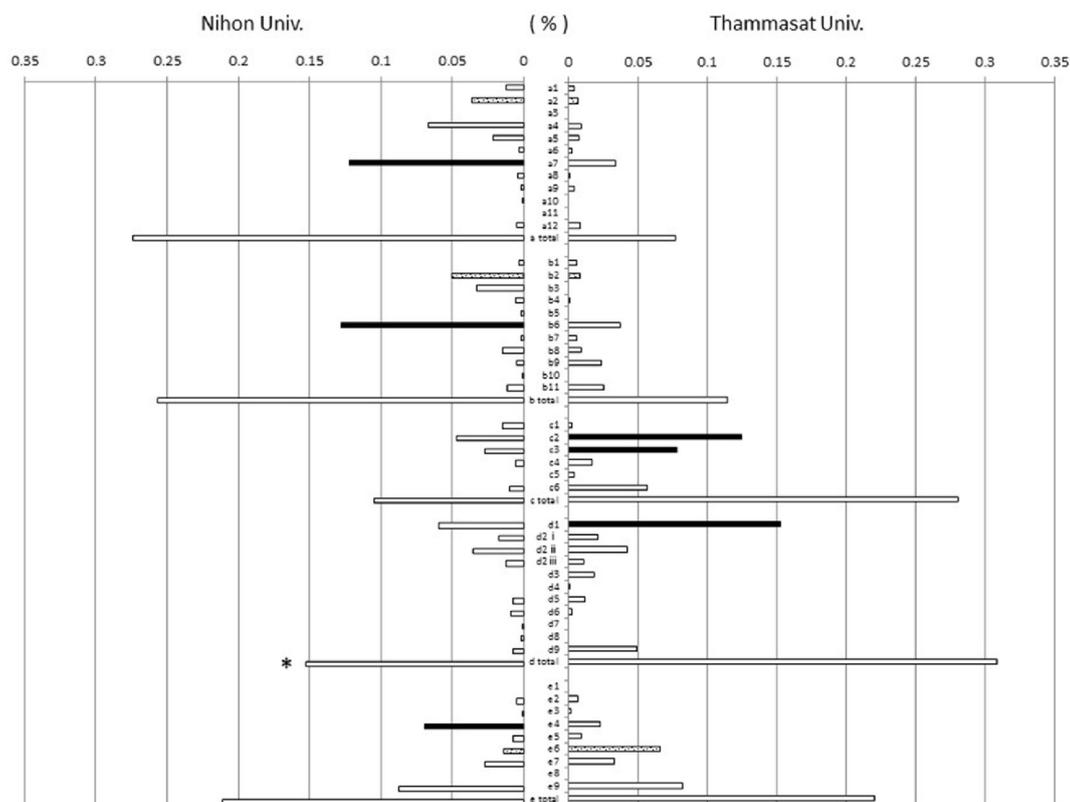


Figure 1 Comparison of the surgery data of Nihon Univ. ENT and Thammasat Univ. ENT (graph of percentage), * $p < 0.05$.

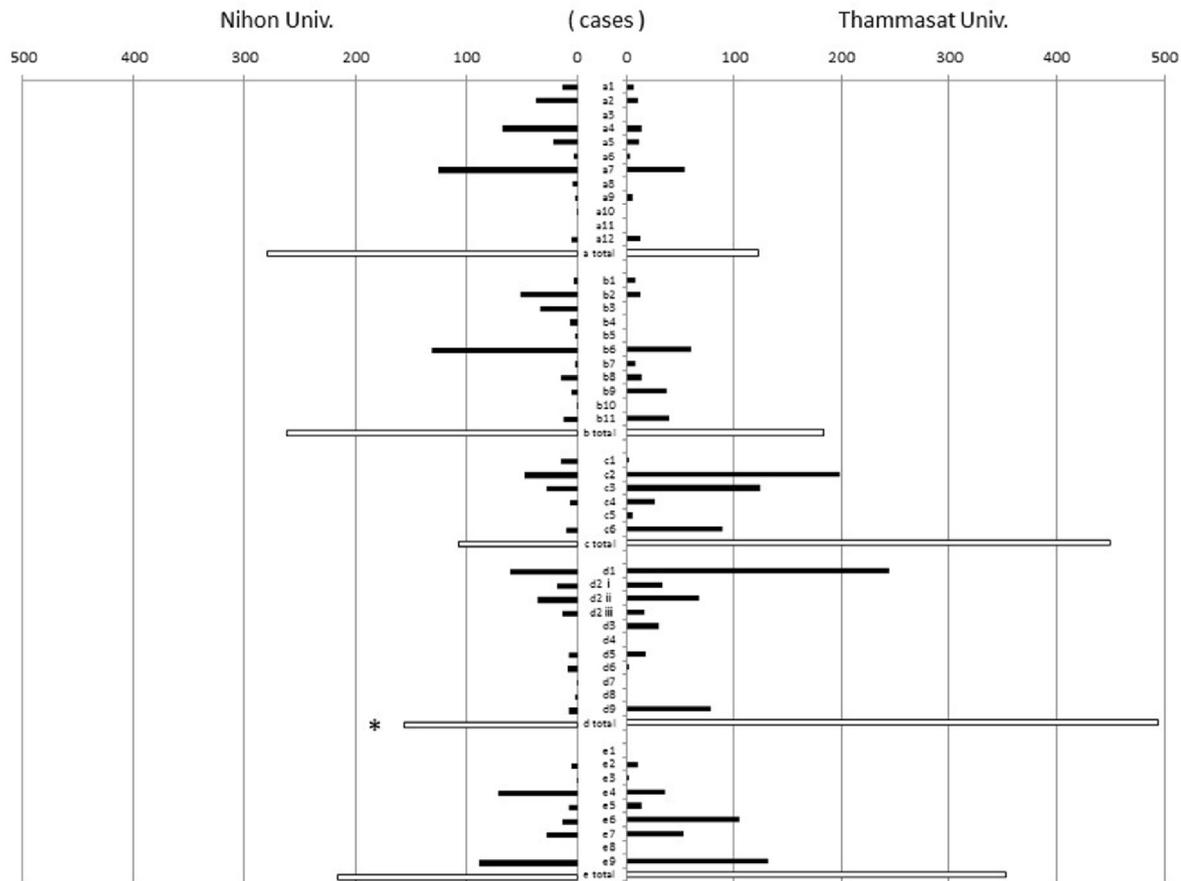


Figure 2 Comparison of the surgery data of Nihon Univ. ENT and Thammasat Univ. ENT (graph of numbers of the cases), *p < 0.05.

located. On the other hand, there are no other university hospitals or major hospitals in the Thammasat University Hospital area because it is in a relatively remote location approximately 80 km away from Bangkok. Therefore, there exists the possibility that surgical cases from the surrounding area concentrated on the Thammasat Univ. ENT and resulted in a large number of operations performed.

We will examine the breakdown of the surgeries. The top 10 surgeries are listed in order of frequency in Table 2a–c. Fig. 3 shows the top 3 surgeries at each university. The top 3 at Nihon Univ. ENT were paranasal sinus surgery

(endoscopic), tympanoplasty and salivary gland tumor surgery.

There are two reports which examined otolaryngology surgery statistics in Japan for the same 2 years as this study, 2013 and 2014.^{1,2} According to those reports, in 2013 and 2014, the 1st most frequently performed surgery was nasal sinus surgery (29.7%); the 2nd was middle ear surgery (28.2%); the 3rd was pharyngeal surgery (21.1%); the 4th was neck surgery (12.7%). The hospital of this reference is a major hospital with over 700 beds and is located in the center of the capital of a prefecture in Japan similar to

Table 2a The surgeries of each rank of 1–10 (numbers of the percentage).

Rank	Nihon Univ.	%	Thammasat Univ.	%
1st	Paranasal sinus surgery (endoscopic)	12.8	Tracheotomy	15.2
2nd	Tympanoplasty	12.2	Tonsillectomy	12.4
3rd	Surgery of salivary gland tumor	7.0	Adenoidectomy	7.8
4th	Tracheotomy	6.0	Surgery of thyroid tumor	6.6
5th	Septoplasty	5.0	Endoscopic surgery (laryngeal tumor)	4.2
6th	Tonsillectomy	4.7	Paranasal sinus surgery (endoscopic)	3.7
7th	Ventilation tube insertion	3.6	Tympanoplasty	3.4
8th	Endoscopic surgery (laryngeal tumor)	3.5	Neck dissection	3.3
9th	Turbineotomy	3.3	Cauterization of nasal mucosa (include laser)	2.3
10th	Adenoidectomy	2.7	Surgery of salivary gland tumor	2.1
10th	Neck dissection	2.7		

Table 2b The surgeries of each rank of 1–10 (number of the cases).

Rank	Nihon Univ.	Cases	Thammasat Univ.	Cases
1st	Paranasal sinus surgery (endoscopic)	131	Tracheotomy	244
2nd	Tympanoplasty	125	Tonsillectomy	199
3rd	Surgery of salivary gland tumor	71	Adenoidectomy	125
4th	Tracheotomy	61	Surgery of thyroid tumor	105
5th	Septoplasty	51	Endoscopic surgery (laryngeal tumor)	68
6th	Tonsillectomy	48	Paranasal sinus surgery (endoscopic)	60
7th	Ventilation tube insertion	37	Tympanoplasty	54
8th	Endoscopic surgery (laryngeal tumor)	36	Neck dissection	53
9th	Turbinectomy	34	Cauterization of nasal mucosa (include laser)	37
10th	Adenoidectomy	28	Surgery of salivary gland tumor	36
10th	Neck dissection	28		

Nihon Univ. Itabashi Hospital. Although unrelated factors associated with the hospitals may have influenced the data, it appears that nasal sinus surgery and middle ear surgery had been frequently performed. On the other hand, the Ministry of Health, Labour, and Welfare in Japan published the Japanese National Insurance Database (NDB open data Japan) in 2016.³ According to the database, the number of cases of each operative procedure performed in Japan from April 2014 to March 2015 were 473,946 cases of myringoplasty, 70,099 cases of ventilation tube insertion, 63,441 cases of tonsillectomy, 50,183 cases of endoscopic sinus surgery, 33,719 cases of tracheostomy, 15,456 cases of tympanoplasty. Browsing these nationwide statistics of surgery, some differences were revealed from our results. Considering the reason why the frequency of the surgeries

is different from nationwide big database, we investigated a university hospital and quoted the reference of a rather big size major prefectural hospital. Those hospitals enable doctors to undergo much more specific kinds of surgeries especially compared to other common small or middle size hospitals. Therefore, our results might show the tendency of the university hospitals as a kind of major hospital of the two countries as well. In addition, we could not find big data which selected only university hospitals in both countries.

About endoscopic paranasal sinus surgery and tympanoplasty, they are commonly performed in Japan (not limited to Nihon Univ. ENT). These operations require specialized equipment such as endoscopy and video monitor systems, large surgical microscope systems and others. In Japan, there are domestic medical instrument companies manufacturing them, so there are many surgeons who are accustomed to those kinds of surgeries. In Thailand, those instruments and devices must be imported and thus are far more cost-prohibitive.

Salivary gland tumor surgery at Nihon Univ. ENT is classified as neck surgery according to the classification system proposed by Ariki et al.^{1,2} Among Nihon Univ. ENT surgeries, salivary gland (parotid and submandibular gland) tumor excision surgery was performed 30 cases in 2013 and 41 cases in 2014 for a total of 71 cases in two years. This was the 3rd most frequently performed surgery. Nihon Univ. ENT had performed quite a large number of salivary gland surgeries. According to the recent report of parotid gland surgery in Japan, the average number of it in two years were approximately 33 cases (Moro et al⁴), 32 cases (Takano et al⁵) and 31 cases (Kondo et al⁶). For submandibular gland tumor surgery, the average number of it in two years was approximately 5 cases (Tanaka et al⁷), 4 cases (Tachibana et al⁸) and 3 cases (Ueda et al⁹). According to these reports in Japan, the average for parotid gland tumor surgery was 32 cases, and 4 cases of submandibular tumor surgery every two years. Taken together, the average number of salivary gland tumor surgery including both parotid and submandibular glands, is 36 cases every two years in Japan. The average number of these surgeries performed at Thammasat Univ. ENT was found to be 36 every two years which was similar to the average number in Japan. However, the reason why salivary gland tumor surgery was so frequent (71 cases every two years) at Nihon

Table 2c Aggregated rank of two ENTs (numbers of the percentage).

Aggregated rank	Nihon Univ. and Thammasat Univ.	%
1st	Tracheotomy (ranked 1st at Thammasat Univ.)	15.2
2nd	Paranasal sinus surgery (endoscopic) (ranked 1st at Nihon Univ.)	12.8
3rd	Tonsillectomy (ranked 2nd at Thammasat Univ.)	12.4
4th	Tympanoplasty (ranked 2nd at Nihon Univ.)	12.2
5th	Adenoidectomy (ranked 3rd at Thammasat Univ.)	7.8
6th	Surgery of salivary gland tumor (ranked 3rd at Nihon Univ.)	7.0
7th	Surgery of thyroid tumor (ranked 4th at Thammasat Univ.)	6.6
8th	Tracheotomy (ranked 4th at Nihon Univ.)	6.0
9th	Septoplasty (ranked 5th at Nihon Univ.)	5.0
10th	Tonsillectomy (ranked 6th at Nihon Univ.)	4.7

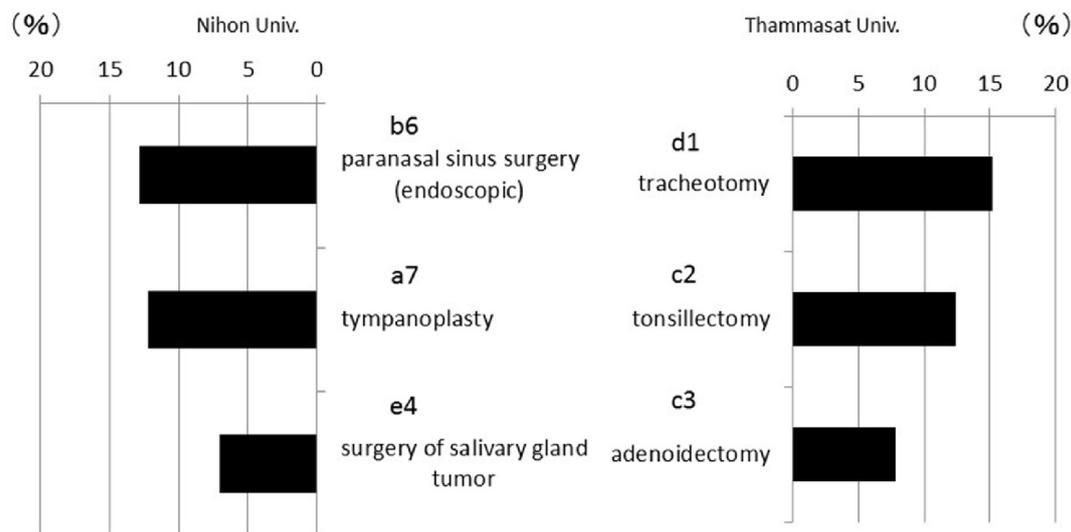


Figure 3 Top 3 most frequently performed procedures (graph of percentage).

Univ. ENT is unknown. Regional factors might have played a role, but there are no existing reports. According to the National Insurance Database in Japan,³ 7820 cases of parotid gland surgery and 3083 cases of submandibular gland surgery were performed per one year. The reason salivary gland tumor surgery was more frequent at Nihon Univ. ENT could not be ascertained. There might be an abnormally large number of patients in northwestern Tokyo, or there might be few hospitals which offered this treatment option, but there were no existing reports addressing this point.

At Thammasat Univ. ENT the top 3 most frequently performed surgeries were tracheotomy, tonsillectomy and adenoidectomy. There exist a variety of surgical indications for tracheotomy according to the pathological status of the patients; long-term endotracheal intubation with chronic respiratory insufficiency, recurrent nerve paralysis, airway obstruction, and others.^{10–12} At Nihon Univ. ENT, tracheotomy for long-term intubation patients is usually performed under local anesthesia at the bedside on the ward. It means they are not performed in the operating room and therefore not included among the data in this study. However, at Thammasat Univ. ENT, most tracheotomies are performed in the operating room regardless of the type of anesthesia (local or general). Therefore, the number of tracheotomies in Thammasat Univ. ENT was very large by comparison. Additionally, Thammasat University Hospital has 17 operating rooms, whereas Nihon University Itabashi Hospital has 13 rooms. It may be reasonable to suppose that operating rooms are more accessible at Thammasat Univ. ENT.

Tonsillectomy and adenoidectomy are typical treatments for these common indications; sleep apnea syndrome due to tonsillar hypertrophy, or habitual tonsillitis.^{13–15} Normally in Japan, surgeries, such as tonsillectomy and adenoidectomy are frequently performed at small or middle size general hospitals in Tokyo, too. This could explain why the number of these surgeries at Nihon Univ. ENT was smaller than those at Thammasat Univ. ENT. There are also conservative treatments such as cPAP in addition to surgical treatment for sleep apnea syndrome.^{16,17} Because Nihon

University Itabashi Hospital has a special sleep disorder treatment facility known as the sleep center, it is also possible that a larger number of patients undergo conservative treatment such as cPAP which would result in a lower number of surgeries to treat patients with sleep apnea syndrome.

Tonsillectomy and adenoidectomy were more common at Thammasat Univ. ENT likely because of the remote location as compared with Nihon Univ. ENT where neighboring hospitals also perform these surgeries. Differences in expertise between Nihon University Itabashi Hospital and Thammasat University Hospital for sleep apnea syndrome treatment may have also been a factor affecting the results. As described above and shown in Table 2c, examination of the aggregate data from both institutions revealed that among the top 6 most frequently performed surgeries, none in the top 3 from one institution overlapped with the top 3 from the other institution.

Although omitted from the aggregated data shown in Table 2c, thyroid tumor surgery was ranked 7th at Nihon Univ. ENT and 4th at Thammasat Univ. ENT. Again, the difference between the two universities was large.

Both Nihon Univ. and Thammasat Univ. perform thyroid surgery, not only the ENT departments. The department of Endocrine Surgery of Nihon Univ. undergoes thyroid surgery and the Department of General Surgery of Thammasat Univ. undergoes thyroid surgery, too. Therefore, some biases might influence the number of the thyroid surgeries of the two ENT departments.

Besides it, in Thai literature, minimally invasive thyroid surgery seems to be a topic of recent years and there may be a tendency to perform surgery more frequently.^{18,19} Furthermore, ethnic factors such as iodine intake and metabolism might have existed, but no report was found.

The surgery ranked 8th, septoplasty, was relatively more frequent at Nihon Univ. ENT. In general, the indication symptom for septoplasty is nasal obstruction. On the other hand, at Thai hospitals such as Thammasat Univ. ENT, augmentation rhinoplasty including plastic surgery and cosmetic surgery for saddle nose is very common as

compared with Japanese hospitals. Those kinds of nasal surgeries effectively treat symptoms of nasal obstruction simultaneously. That is why, the number of septoplasties for nasal obstruction at Thammasat Univ. ENT was small.^{20,21}

As we described above, the apparent feature difference and specific individual tendencies among the otolaryngology surgeries between two university hospitals in Japan and Thailand were revealed. It appears that the two facilities have their own specialized knowledge and surgical techniques in their area of specialty. It is surely useful and important to offer information and experiences each other in order to improve medical knowledge and technology mutually in Japan and Thailand. Continuing further international exchange of medical staff and detailed surgical data and statistics can only help foster a mutually beneficial learning environment for all those involved.

5. Conclusions

Comparing surgery data from Nihon Univ. ENT with those from Thammasat Univ. ENT over the two years from 2013 to 2014 revealed several features. This is the first report to compare Japanese and Thai surgical statistics in the field of otolaryngology.

- 1) The number of surgeries was larger at Thammasat Univ. ENT as compared with those at Nihon Univ. ENT despite having a smaller number of hospital beds. The most likely reason was considered to be the influence of the location and conditions surrounding the two hospitals as well as the influence of neighboring hospitals.
- 2) Among the top 6 surgeries performed, the top 3 at Thammasat Univ. ENT were different from the top 3 at Nihon Univ. ENT. This was a very notable finding which emerged from this study. The reasons were considered to be the influence of the availability of medical equipment/instruments, the differences of the surgical indications and the location and situations surrounding the hospitals.
- 3) The features of the two ENTs were revealed. The two facilities have their own specialized knowledge and surgical techniques in their area of specialty. Japan and Thailand can both benefit from a mutually beneficial exchange of ideas and expertise in order to ultimately deliver a higher level of patient care in both countries.

Conflict of interest

There is no conflict of interest.

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There are no conflicts of interest to disclose.

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