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ORIGINAL ARTICLE

Office-based narrow band imaging-guided flexible laryngoscopy tissue sampling: A cost-effectiveness analysis evaluating its impact on Taiwanese health insurance program[☆]



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Background/Purpose: Narrow band imaging (NBI)-guided flexible laryngoscopy tissue sampling for laryngopharyngeal lesions is a novel technique. Patients underwent the procedure in an office-based setting without being sedated, which is different from the conventional technique performed using direct laryngoscopy. Although the feasibility and effects of this procedure were established, its financial impact on the institution and Taiwanese National Health Insurance program was not determined.

Methods: This is a retrospective case–control study. From May 2010 to April 2011, 20 consecutive patients who underwent NBI flexible laryngoscopy tissue sampling were recruited. During the same period, another 20 age-, sex-, and lesion-matched cases were enrolled in the control group. The courses for procedures and financial status were analyzed and compared between groups.

Results: Office-based NBI flexible laryngoscopy tissue sampling procedure took 27 minutes to be completed, while 191 minutes were required for the conventional technique. Average reimbursement for each case was New Taiwan Dollar (NT\$)1264 for patients undergoing office-based NBI flexible laryngoscopy tissue sampling, while NT\$10,913 for those undergoing conventional direct laryngoscopy in the operation room ($p < 0.001$). The institution suffered a loss of at least NT\$690 when performing NBI flexible laryngoscopy tissue sampling.

Conflicts of interest: The authors have no conflicts of interest relevant to this article.

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Conclusion: Office-based NBI flexible laryngoscopy tissue sampling is a cost-saving procedure for patients and the Taiwanese National Health Insurance program. It also saves the procedure time. However, the net financial loss for the institution and physician would limit its popularization unless reimbursement patterns are changed.

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Introduction

One of the major goals of modern medicine is to reduce medical and social costs of healthcare without influencing the outcomes. Since the advancement of equipment and technique, most practices have become simplified and less invasive. A minimal invasive procedure not only decreases patients' morbidity, but also reduces hospital stay and related costs.

Recent advances in flexible endoscopy and imaging system have made it possible to perform some of the laryngological procedures in an office-based setting. The feasibility and safety of office-based flexible laryngoscopes have previously been documented.^{1,2} Tissue sampling of the tail of oropharynx and laryngopharynx is performed conventionally in the operation room under general anesthesia. Although the safety of general anesthesia has also been improved, postanesthesia symptoms and tumor obscuring still make the procedure risky. Narrow band imaging (NBI) system has been proved to be an optimal technique to distinguish neoplasm from normal tissue, on the basis of the enhanced neo-angiogenetic pattern of the tumor (Fig. 1). The combination of an NBI laryngoscopy system and a flexible biopsy forceps enables preparation of precise tissue specimens in an office setting without sedating the patients. In our previous report, office-based NBI flexible laryngoscopy tissue sampling has been shown to be an effective and safe procedure even in patients with restricted airway passage² (Fig. 2).

Although office-based tissue sampling is thought to be as effective as or even better than the conventional approach, the associated cost and reimbursement based on the Taiwanese National Health Insurance (NHI) program have not yet been analyzed. The Taiwanese NHI program provides citizens universal coverage and access to quality healthcare at affordable costs. Most people living in Taiwan have comprehensive healthcare, with expenditure accounting for only about 6.9% of the gross domestic product,

lower than most of the Organization for Economic Cooperation and Development countries.^{3,4} The national public health insurance system in Taiwan is considered to be one of the best and most effective national health systems in the world.

Inadequate reimbursement makes it difficult to adopt new practices. For example, Kuo and Halum⁵ reported that, under the USA healthcare reimbursement system, office-based laser surgery of the larynx cannot reach widespread adoption because the reimbursement system will cause a net financial loss if that procedure is used. We believe that every new procedure should be analyzed in terms of its cost effectiveness to determine appropriate reimbursement charges. The present study intends to compare the cost and reimbursement between office-based NBI flexible laryngoscopy tissue sampling and the conventional operation-room approach in Taiwan. We also analyzed the reimbursement amount for the physician performing this technique and compared it with the payment of noninvasive regular outpatient clinics.

Materials and methods

From May 2010 to April 2011, 20 consecutive patients who underwent office-based flexible laryngoscopy laryngopharyngeal biopsies were enrolled. All cases were diagnosed to have a malignant or benign lesion at distal oropharynx, hypopharynx, or larynx. The control group consisted of another 20 cases, matched with sex, age, and site in the same period, in whom biopsy had been performed in the operation room under general anesthesia.

Ethical consideration

Prior to commencing the study, the process of data collection and analysis had been approved by the



Figure 1 (A) A left pyriform sinus tumor, which masqueraded as lymphoid tissue, and (B) a clearer view of it using magnified flexible laryngoscopy. The margin of the tumor in regular white light (arrows in B) and enhanced under narrow band imaging (NBI) light (arrows in C).

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