INTRODUCTION

Management of the clinically N0 neck in early stage head and neck squamous cell carcinoma remains a challenge for clinicians. Physical examination and radiographic imaging lack the sensitivity and specificity to accurately stage N0 patients leading many surgeons to recommend elective neck dissection for clinically N0 patients whose risk of occult metastasis is greater than 15% to 20%. Pathologic nodal staging is the gold standard, although it does carry morbidity and increased cost of elective neck dissection. Clinicians have been investigating less invasive methods for staging clinically N0 patients.

Sentinel lymph node biopsy (SLNB) is a minimally invasive method of staging the regional lymphatics. SLNB has been effectively utilized in urologic and breast malignancies as well as cutaneous melanoma. There is mounting evidence that SLNB is a viable option in SCC of the upper aerodigestive tract. Recent studies have successfully identified the SLN in 93% of patients with T1 and T2 N0 carcinomas in the oral cavity and oropharynx and demonstrated that the SLN accurately predicted pathologic N stage in 97% of patients with early stage oral cavity tumors.

Drawbacks in the use of SLNB in the head and neck include unsatisfactory placement of incisions, the number of nodes requiring biopsy, and key structures adjacent to nodes that may be difficult to identify through small SLNB incisions. An endoscopic approach could resolve these concerns. At our institution, we have previously demonstrated that SLNB is technically feasible in the porcine model. We now seek to evaluate our technique in human cadavers.

RESULTS

Using our port placement, it was possible to expose all six levels of lymph nodes in the neck. Our port placement consisted of a 12 mm trocar placed at midline above the sternal notch with one 5mm port just lateral on each side of the primary port. The central port was primarily used for the camera, except while maneuvering the endoscopic gamma probe which requires the 12 mm port. Bilateral necks were exposed through the midline ports. Relevant landmarks and major structures were successfully identified and preserved. In all four necks the great vessels, CN XI, submandibular gland, facial artery, and retrofacial vein were all identified and preserved. Lymph node levels 1 through 5 were all successfully exposed. CO2 insufflation was successful at preserving exposure within the dissection pocket at a very low pressure and rate (3psi at 1 liter/min). We found that port placement can be moved laterally along a standard neck dissection incision for more directed exposure of individual levels as may be the goal in sentinel lymph node biopsy.

METHODS

Two unembalmed cadavers were obtained from the University of Mississippi Medical Center Department of Anatomy. Endoscopic neck dissection was carried out on four necks with special attention paid to port placement, exposure of lymph node levels, and identification of relevant landmarks and structures. A combination of blunt dissection and CO2 insufflation were used to facilitate dissection and exposure. The port placement, node levels identified, and landmarks identified and preserved were noted. No dye or radiotracer was injected, but the endoscopic gamma probe was maneuvered in each neck to ensure feasibility.

CONCLUSIONS

Endoscopic sentinel lymph node biopsy is feasible in the human neck. Based on these results, our previous success in animal studies as well as previous literature, this could be a viable alternative to open biopsy that may prove to be superior with regards to cosmesis and morbidity. Additional research is necessary in the clinical setting to determine applicability to living patients.