Salvage neck surgery in nasopharyngeal cancer recurrence: Do all patients require a comprehensive neck dissection in the modern MRI era?

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Introduction

The standard treatment for regional failure in Nasopharyngeal carcinoma (NPC) is salvage radical neck dissection (RND) based on a landmark study by William Wei et. al.[1]. Routine employment of RND is, however, associated with significant acute and chronic morbidities. Our study sought to determine if modern-day magnetic resonance imaging (MRI) may be better able to predict nodal involvement, to allow selected levels of neck dissection to be preserved, thus reducing morbidity of treatment.

Patients and Methods

This retrospective study was carried out from February 2002 to February 2017. All NPC patients in our tertiary center with isolated regional failure after completion of primary radiotherapy (RT) or chemo-radiotherapy (CRT) and who received a (1) preoperative MRI scan (2) RND or modified RND (MRND) were included. 35 patients met these criteria (Table 1). We compared preoperative MRI with postoperative histopathology to determine sensitivities and specificities of MRI.

Patient Characteristics	N = 35 (%)
Gender	
Female	6 (17.1%)
Male	29 (82.9%)
Age	
<60	19 (54.3%)
≥60	16 (45.7%)
AJCC stage	
I	1 (2.9%)
II	9 (25.7%)
III	12 (34.3%)
IV	12 (34.3%)
Unknown	1 (2.9%)
Treatment for primary tumor	
RT	16 (45.7%)
ChemoRT	19 (54.3%)
Recurrent AJCC stage	
rI	3 (8.6%)
rII	28 (80%)
rIII	2 (6.7%)
rIV	2 (6.7%)
Type of surgery	
RND	27 (77.1%)
MDRD	8 (22.9%)

Table 1. Patient characteristics

	Total number of clinically suspicious lymph nodes on MRI in all patients	Range of suspicious lymph nodes per patient on MRI	Mean number of suspicious lymph nodes per patient on MRI	Total number of tumor-containing lymph nodes on histology in all patients	Range of suspicious lymph nodes per patient on histology	Mean number of suspicious lymph nodes per patient on histology	Ratio of suspicious lymph nodes on MRI compared to histology
Wei et al., 1992	59	0 to 5	1.5	294	0 to 62	7.4	4.6
Current study	105	0 to 10	3.0	91	0 to 5	2.6	0.87

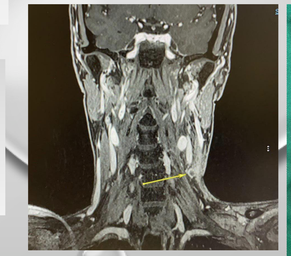
Table 2. The routine use of preoperative MRI has allowed us to significantly improve detection of regional nodal recurrence from a difference of 4.6 times in Wei et al.'s landmark study based on clinical examination and CT to a difference of 0.87 times in our present series of patients.

Disease characteristics	N = 35 (%)
False negatives	
Level I	3 (8.6%)
Level II	0 (0%)
Level III	3 (8.6%)
Level IV	4 (11.4%)
Level V	0 (0%)
Overall	10 (7.5%)
Sensitivity	
Level I	25%
Level II	100%
Level III	70%
Level IV	33%
Level V	100%
Overall	76%
Specificity	
Level I	94%
Level II	67%
Level III	92%
Level IV	97%
Level V	90%
Overall	90%

Table 3. We performed level specific analyses of sensitivities and specificities and found that sensitivities ranged from 25% to 100% by levels and was 76% overall.

Discussion

MRI allowed a much closer approximation of positive lymph nodes compared to clinical examination and computerized tomography (CT) in William Wei et al.'s[1] landmark study (Table 2). However, overall sensitivity of MRI is still only 76% (Table 3). With the aggressive nature of nodal recurrent NPC, basing our neck dissections on MRI alone will result in 8 (22.9%) out of 35 patients having residual nodal disease that is not dissected. This is of clinical importance as salvage surgery is deemed as a last resort to achieve tumour clearance.



Conclusion

Based on our results, modern-day MRI is an improvement over clinical examination and CT scan. However, with an overall sensitivity of 76%, it does not allow for safe selective neck dissections based on MRI alone.

[1]Wei, W. I., Ho, C. M., Wong, M. P., Fung Ng, W., Lau, S. K., & Lam, K. H. (1992). Pathological Basis of Surgery in the Management of Postradiotherapy Cervical Metastasis in Nasopharyngeal Carcinoma. *Archives of Otolaryngology - Head and Neck Surgery*, *118*(9), 923–929. https://doi.org/10.1001/archotol.1992.01880090039012