



Commentary

Shoulder Rehabilitation for Patients Undergoing Neck Dissection for Head and Neck Cancer – The Case for Specialist Follow-up

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INTRODUCTION

More than 12,000 new cases of head and neck cancer (HNC) are diagnosed each year in the UK, with projections expecting this to increase to more than 16,000 every year by 2038-2040.¹ With growing numbers of younger patients diagnosed with Human Papillomavirus (HPV) positive HNC, people are now living longer with the lasting effects of HNC treatment.^{2,3}

Neck dissection (ND) is an important treatment option, with almost half of patients diagnosed with tongue cancer in England and Wales between 2012-2013 undergoing this procedure.⁴ In recent decades, ND surgery has become less aggressive whilst achieving comparable oncological results, resulting in less radical ND and modified-radical ND being used.⁵⁻⁷

Post-operative shoulder dysfunction is a widely recognised side effect of ND, although risk is variable depending on type of procedure and if there has been intra-operative injury to, or resection of, the spinal accessory nerve (SAN).⁸ Despite preservation of the SAN, shoulder dysfunction, and subsequent impact on quality of life (QOL), remains a prevalent issue following even the most conservative ND approaches.⁹

The initial focus of physiotherapy management of HNC surgical patients is to reduce the risk of post-operative pulmonary complications associated with long general anaesthetic, recumbency and heavy smoking history.¹⁰ Respiratory physiotherapists may often be the only member of the profession to have contact with this patient group during their hospital stay. Therefore, this physiotherapy speciality is well placed to identify and support HNC surgical patients with post-operative shoulder dysfunction, as part of their holistic care. Shoulder rehabilitation is beneficial for patients with reduced function following ND and it is recommended that they begin progressive resistance training as soon as possible.^{11,12} Despite this, there is inconsistent provision of post-operative physiotherapy services.¹³ The ability to provide necessary neuromusculoskeletal management to this specialist patient group is therefore a growing priority and concern for physiotherapy services.

Through review of current literature, this commentary explores evidence for which SAN preserving ND patients

are in greatest need of post-operative shoulder rehabilitation. To reflect current surgical practices, focus of this commentary will be on selective ND procedures only, with limited consideration to radical and modified-radical procedures.

SELECTIVE NECK DISSECTION (SND) AND SHOULDER MORBIDITY

Lymph node levels considered low risk of cervical metastasis, and all non-lymphatic structures in the neck, are preserved in a SND.¹⁴ The spread of cancer to lymph nodes from HNC is often predictable which now enables SND to be performed as an alternative to more extensive procedures.¹⁵ SND's are associated with lower incidence of shoulder morbidity,¹⁶ however, the issue is not eliminated as the SAN remains vulnerable to trauma.⁹ This population is key for investigation given that a substantial proportion of patients with HNC undergo SND as part of their cancer treatment.¹⁷

The SAN descends within the posterior triangle of the neck and is encountered in lymph node levels 2 and 5.^{15,18} Inclusion of these levels has been linked with increased risk of shoulder dysfunction given proximity of lymph nodes to the SAN.^{15,19} Anatomically, the SAN divides level 2 into levels 2a and 2b, with level 2b lymph nodes situated posterior to the SAN. The relationship between dissection of level 2b and shoulder impairment and function has been of much interest within recent literature.

Three small experimental studies investigated shoulder morbidity outcomes for 2b-preserving, compared to non-preserving surgery.⁵⁻⁷ Shoulder range of motion (ROM) and QOL outcome measures featured in each study, and all demonstrated superior outcomes in favour of preserving level 2b. Significantly greater impairment in shoulder abduction at four to six months follow-up in those who underwent level 2b dissection was a key finding amongst the three studies. The study populations represent the most common type of head and neck cancer,¹ potentially providing good generalisability.

PHYSIOTHERAPY PROVISION

Physiotherapy intervention after ND is indicated from existing literature.^{12,20,21} A 2019 systematic review concluded that patients with shoulder dysfunction after ND benefit from physiotherapy intervention, however, acknowledged that all studies presented varying issues with design.²⁰ One included study demonstrated that progressive resistance exercise training has a beneficial effect on shoulder pain and function in patients with SAN dysfunction, and is now recommended within NICE guidelines.^{11,12} Participants attended at least two supervised exercise sessions per week over a 12-week period.¹² When considering application to National Health Service practice, the feasibility of providing this level of supervised intervention is unrealistic due to funding and resource limitations. Group sessions would be more achievable in terms of resources; however, this may not be an effective delivery model given complex and varying patient presentations.

The benefits of physiotherapy, and evidence supporting prevalence of shoulder dysfunction in the least invasive ND procedures is clear.^{5,6,12,18,20} Despite this, current provision of physiotherapy services within the UK is inconsistent and does not reflect patient need.^{11,13} Only a third of centres provide routine inpatient physiotherapy following ND and none routinely offer outpatient follow-up to all patients.¹³ Our own local patient feedback demonstrates a desire for specialist physiotherapy however given the growing population of patients with HNC and limited funding availability, it is unrealistic to offer all ND patients specialist outpatient physiotherapy follow-up. Therefore, there is a need to identify which patient groups are at highest risk of shoulder dysfunction and should be prioritised to receive specialist input.

CONCLUSION

All patients who undergo ND for HNC are at risk of shoulder dysfunction due to sacrifice or potential trauma to the SAN.⁸ Highest risk groups are those who undergo more radical procedures.^{8,16} SAN preservation does not eliminate

risk of SAN injury, subsequent shoulder dysfunction and reduced QOL, even in the most conservative procedures.^{5,6} Level 2b dissection places patients at higher risk of shoulder dysfunction within the SND population, due to proximity of lymph nodes to the SAN.^{15,19} In the presence of limited resources, it is reasonable to consider prioritisation of rehabilitation for patients who have undergone resection of the SAN and/or level 2b dissection. Group interventions should be explored for efficiency and efficacy of delivery. Upskilling of the current physiotherapy workforce involved in the care of ND patients is required to deliver specialist intervention to this complex patient group.

Key Points

- All patients who undergo neck dissection for head and neck cancer are at risk of shoulder dysfunction.
- Inclusion of level 2b is associated with higher risk of shoulder dysfunction.
- Patients who undergo dissection of level 2b during neck dissection should be prioritised for post-operative specialist rehabilitation.

DECLARATION OF INTEREST

None of the authors have declared any conflict of interests.

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