ABSTRACT

Objective

To assess the efficacy and outcome of a pilot model in triaging urgent suspected head and neck cancer referrals during the Covid-19 pandemic.

Design

Prospective observational cohort study

Setting

Regional Head and Neck Cancer hub, United Kingdom.

Participants

84 patients who were referred via the 2-week wait pathway and streamed directly for imaging investigations after initial telephone consultation.

Main outcome measures

The malignancy detection rate using the telephone-and-test model

Results

495 2-week wait referrals were received during the study period. 104 patients were discharged following their initial telephone consultation. 84 (17%) patients were streamed directly for imaging investigations following their telephone consultation.

Malignancy was identified in 11.9% of patients which included squamous cell carcinoma, differentiated thyroid carcinoma and lymphoproliferative disease. 51% of patients had other benign pathologies such as benign salivary gland tumour, benign thyroid disease and physiological lymphadenopathy. Following their radiological investigation, 48.8% of patients were discharged without any need for further consultations.

Conclusions

The telephone-and-test approach is an effective and efficient model for triaging head and neck two-week wait referrals, which could be applicable outside the pandemic times.

Keypoints

1. The TnT model is an effective model for maintaining 2-week wait referral service during the pandemic.
2. It has a comparable pick-up rate of 11.9% for malignancy.
3. A pathology was detected in 68% of the patients after TnT.
4. Nearly 50% of the patients were discharged without the need for further consultation after TnT.
5. The TnT model reduces the time to diagnosis and treatment for 2-week wait referrals.

Keywords

Two-week wait, head and neck, Covid-19, telephone-and-test

No conflict of interest.

No disclosures required

The data that support the findings of this study are available from the corresponding author upon reasonable request.

INTRODUCTION

The Covid-19 pandemic has wreaked havoc across the globe. None had borne the brunt more than the medical services, especially in trying to contain the pandemic as well as sustaining the rest of the health services at the same time.

One such example is the service provision for urgent suspected head and neck cancer referrals which has been majorly affected. The concerns surrounding the service included reduced outpatient capacity, aerosol generating procedures, delayed cancer diagnosis and the risk of contracting the coronavirus from a visit to the hospital.

NHS England published a guideline to recommend a telephone triage system to minimise interactions and appointments for all medical services. It also recommends that where appropriate, patients should be streamed directly for investigations following the telephone triage. [1] The British Association of Head and Neck Oncologists (BAHNO) together with ENT UK also issued a joint statement recommending prioritising cases that are likely to represent malignancy and deferring cases with a lower likelihood. A one-stop service is preferable where possible. [2]

OBJECTIVES

The authors have therefore designed a protocol to prioritise our urgent suspected head and neck cancer referrals in line with the guidelines. This study looks at the outcome of the service protocol and in particular, the efficacy and practicality of a pilot “Telephone-and-Test” (TnT) approach, consisting of a telephone consultation in combination with imaging, in triaging urgent suspected head and neck cancer referrals. The questions we hope to answer are:

1. How effective is the system in identifying pathology?
2. Is the system placing additional strain on radiology services in pandemic times?
3. Is this a cost-effective triaging system?
4. Can this protocol be extrapolated and applied outside pandemic times?

SETTING

Regional Head and Neck Cancer Hub serving a population of more than 1.2 million people.

METHODS

A prospective study was carried out during the Covid-19 pandemic from April 2020 to November 2020. All patients referred via the urgent suspected head and neck cancer referrals (two-week wait) were identified. All telephone consultations were carried out by consultants only. Patients were risk stratified into low-risk and high-risk group according to their symptoms using the head and neck cancer risk calculator (HaNC-RC). Low-risk (less than 2 per cent risk of cancer) patients were discharged back to primary care with safety-net advice. [3] High-risk patients who require clinical correlation were given an urgent appointment (Figure 1).

Other high-risk patients or low-risk patients with a neck lump, dysphagia or odynophagia, B or systemic symptoms and prior positive pathological investigation (from general practitioners or other

specialties) were streamlined directly to imaging based on suspected pathology after their telephone consultation. Only these patients were included in this study. Data including the final diagnosis, pathology and imaging results were all recorded (Figure 2). A subsequent analysis of the efficacy of this triage pathway in terms of follow-up, discharges, malignancy pick-up rate, cost and waiting-times effectiveness and the impact on radiology services was also performed.

All patients who did not require further follow-up after radiological investigations were discharged with a letter detailing the diagnosis and investigation result.

The results were reporting using the SQUIRE 2.0 checklist.

PARTICIPANTS

Patients who were referred via the two-week wait pathway and managed using the TnT model.

MAIN OUTCOME MEASURES

The malignancy detection rate using the Tnt model.

RESULTS

495 two-week wait referrals were received during the study period. 104 patients were discharged following their initial telephone consultation. 127 patients were removed from the two-week wait pathway and downgraded to a routine appointment. 180 patients were given an urgent face-to-face appointment.

In total, 84(n) patients were streamed directly for imaging investigations following their telephone consultation. There were 31 male and 53 female patients. The mean age was 54.9 (range 21-89).

The three most commonly requested investigation in order of decreasing frequency was ultrasound (US) of the neck (39.3%), ultrasound of the thyroid gland (28.6%) and barium swallow (11.9%). The rest of the patients had ultrasound of salivary gland, CT of the sinuses, MRI of the neck or MRI of the sinuses. 4 patients had multi-modality imaging based on suspected pathology. 21 (25%) patients had US guided biopsy of the neck, thyroid or salivary gland (Figure 3).

By using the TnT model, a pathology was identified in 57 (67.9%) patients. 10 (11.9%) patients had malignant disease and 47 (56%) patients had benign disease. 27 (32.1%) patients had normal findings on imaging.

Of the patients with malignancy, 5 patients had lymphoma, 2 had oropharyngeal squamous cell carcinoma (SCC) and 3 had papillary thyroid carcinoma. The most common benign pathology included benign thyroid nodules/goitres and reactive lymph nodes (Figure 4).

Following their radiological investigation, 41 (48.8%) patients, including those with benign pathology or normal radiological findings were discharged without further consultations. The rest of the patients were followed up for various reasons such as to break bad news, need for clinic examination including flexible nasendoscopy, persistent symptoms or patient request and reassurances.

DISCUSSION

Pathology and Malignancy Rate

The proportion of urgent suspected head and neck cancer referrals who were diagnosed with cancer from published studies in the literature ranged from 6% to 14.6% (Table 1). A meta-analysis of 17

studies in 2016 indicated an overall pooled conversion rate of 8.8% (95% CI 7.0% to 10.7%). [4] It is important to bear in mind that these studies were performed outside pandemic times, when clinicians were able to inspect, examine and perform endoscopy.

The current study on the other hand, was able to detect cancer in 11.9% of the patients from a combination of telephone consultation, use of risk calculator and radiological investigations, which is comparable to the figures from the meta-analysis. Furthermore, we had also identified pathology in more than half of patient cohort as described above. Douglas et al and Rimmer et al identified benign pathologies in 26.8% and 40.3% of their patient cohort respectively. [5,6]

Unquestionably, clinical examination and direct visualisation cannot be superseded by imaging tools. Nonetheless, modern day radiology is reliable in aiding diagnosis. For example, ultrasonography is found to be more sensitive compared to clinical examination in detecting pathological cervical nodes (96.8% and 73.3% respectively). [7] It also has a sensitivity of 95% and a specificity of 83% in differentiating metastatic lymph nodes from reactive nodes. [8] Cross sectional imaging such as magnetic resonance imaging (MRI) has a sensitivity of 98% and 85% for detecting primary head and neck tumours and lymph node metastases respectively. [9]

Hence, a combination of good history taking, effective risk stratification and selective radiological investigation as in the TnT model ensures that a cancer diagnosis is not missed or delayed. Should the imaging be normal, but the symptoms worrying, the patients can still be seen for a review. Patients who were discharged were given safety-netting advice and general practitioners (GPs) were advised to re-refer the patient should the symptoms persist or progress.

Resource Implication

Rimmer et al and Douglas et al sent 37.5% and 57% of their patients from 2-week wait referrals for radiological investigations after their consultations whereas we had sent only 17% (n=495) of patients from the overall two-week wait referrals using the TnT model. [5,6] Despite sending considerably fewer patients for imaging, our pick-up rate for malignancy was similar to these studies.

There might be a few explanations for this such as demographics, catchment area, timing of patient presentation due to the pandemic and the fact that we adopted a more stringent approach in referring patients for imaging during the pandemic. However, direct comparison between our study and the literature is difficult for these same reasons.

In addition to the malignancies detected, as mentioned 56% (n=84) of the patients from the current cohort also had benign pathologies. Hence, this validated the clinicians' decision to send the patients for the radiological investigations and provide reassurance for both patients and clinicians.

The authors acknowledged that a third of the patients had normal imaging and hence had a slight impact on our radiological services. This is most likely due to the lack of visual/clinical examination and reliance on patient history or clinical narrative from GPs. However, it is difficult to ascertain if a face-to-face consultation would actually negate this effect. Furthermore, the impact is offset by the reduced number of appointments and decreased footfall in the hospital during the pandemic.

With the stringent use of the risk calculator and good clinical judgement, it is likely that clinical diagnostic accuracy could be improved in the future with the use other tools such as a virtual or video consultation.

Waiting-times Effectiveness

From the service point of view, the initial telephone triage allowed 21% of the 495 patients from the initial 2-week wait referrals to be discharged after one telephone consultation. Subsequently, of the patients who had radiological investigations, a further 48.8% (n=84) of the patients were discharged. In comparison, Rimmer et al and Douglas et al reported discharging 37.5% and 13.4% of their 2-week wait referrals patients respectively after both in-person consultation and investigation. [5,6]

Hence, the TnT model not only reduces the time to diagnosis or/and treatment, it also reduces the number of visits to hospital during the pandemic. Earlier discharges also meant that, future outpatient waiting time is shortened. Other specialty such as general surgery was able to show that, using the straight-to-test approach via gastroscopy or colonoscopy, they were able to reduce the number of outpatient appointments arising from the two-week- wait referrals, thus reducing waiting times for diagnosis and treatment. [10]

From the pandemic point of view, the current approach saves the patients from multiple visits to the hospital, reduces the number of clinical encounters and avoided any aerosol generating procedures. Hence, it minimises the potential exposure to Covid-19 virus for clinical staffs and patients alike.

Limitations of study

The obvious limitations of this study is the small sample size, which render it difficult to establish any statistical significance. This could have also contributed to the higher number of cancer detection rate and discharges rate. The use of the (HaNC-RC) risk calculator may be more specific for other head and neck cancers but not thyroid malignancies. Hence, inadvertently patients with thyroid nodule/goitre would be considered high-risk.

To date, none of the patients who were discharged had re-presented with a malignant disease. It would be interesting to perform a longer-term follow-up or a retrospective study to look into this as a measure of effectiveness of the pilot model, something the authors have plan to do.

CONCLUSION

In such unprecedented and challenging times, the TnT model has enabled the department to maintain its' urgent head and neck cancer referral service. It has comparable results to other pre-pandemic 2-week wait referral services and was able to reduce patient visits and exposure prone procedures for both clinical staff and patients at the same time. The authors would therefore advocate the use of this simple model in other head and neck units within the country during this difficult time.

We also feel that this pilot model has the potential to be utilised outside the pandemic, something which we aim to implement. However, a bigger sample size with longer-term result is required to provide a more conclusive result especially if it were to be translated into future practice in the secondary care or even primary care setting.

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TABLES

Authors	Year	Sample size	Detection rate (%)
Williams [12]	2002	100	11
Lyons [13]	2004	171	14.6
Shah [14]	2005	150	6
East [15]	2005	48	6.3
Singh [16]	2006	76	7.9
Duvvi [17]	2006	187	10.2
Hobson [18]	2008	177	12.4
McKie [19]	2008	1079	10.9
Ahmad [20]	2011	114	5.3
Haikel (audit 1) [21]	2011	163	10.4
Haikel (audit 2) [21]	2011	542	9.8
Miller (audit 1)	2012	63	11.1
Miller (audit 2)	2012	49	6.1
Madhvani [23]	2012	252	7.9
Rimmer [8]	2012	400	9
Douglas [9]	2019	2116	11.8

Table 1. Malignancy detection rate from other ENT 2-week wait units in the literature.

FIGURES

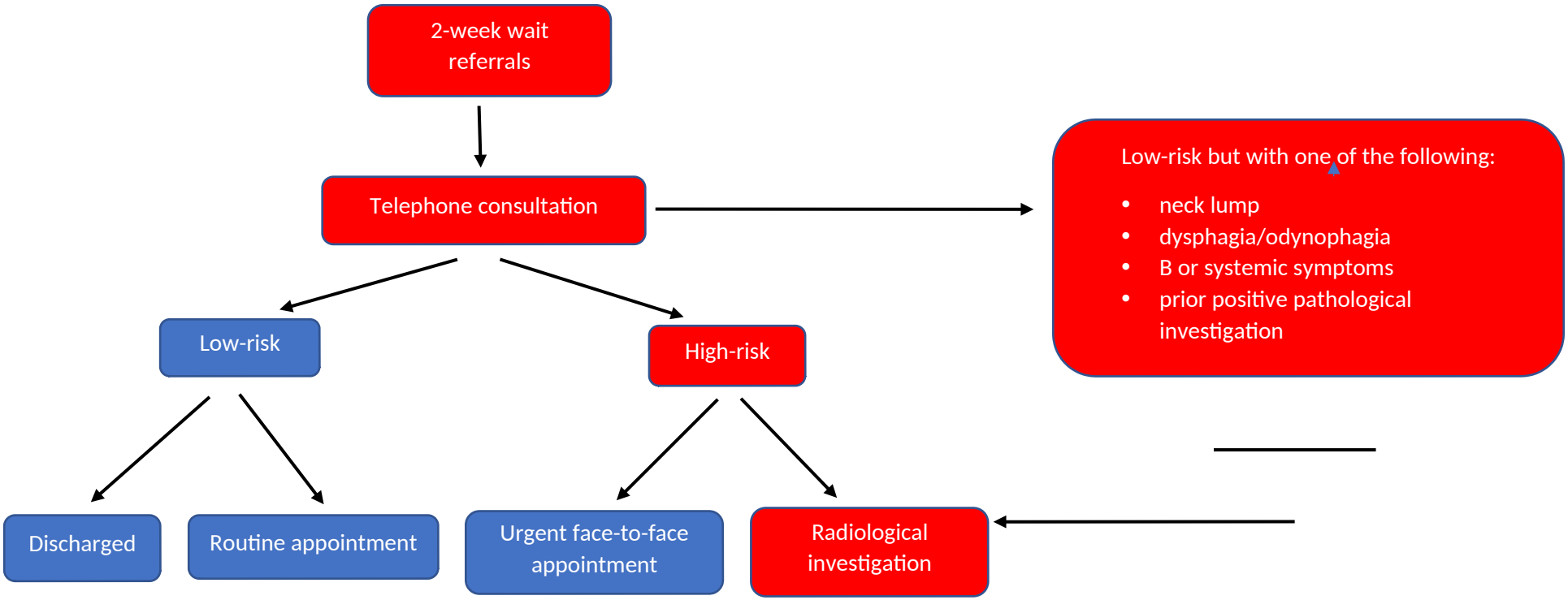

Figure 1. Triage pathway of 495 patients referred via the ENT 2-week wait referrals. Telephone-and-test (TnT) model in red.

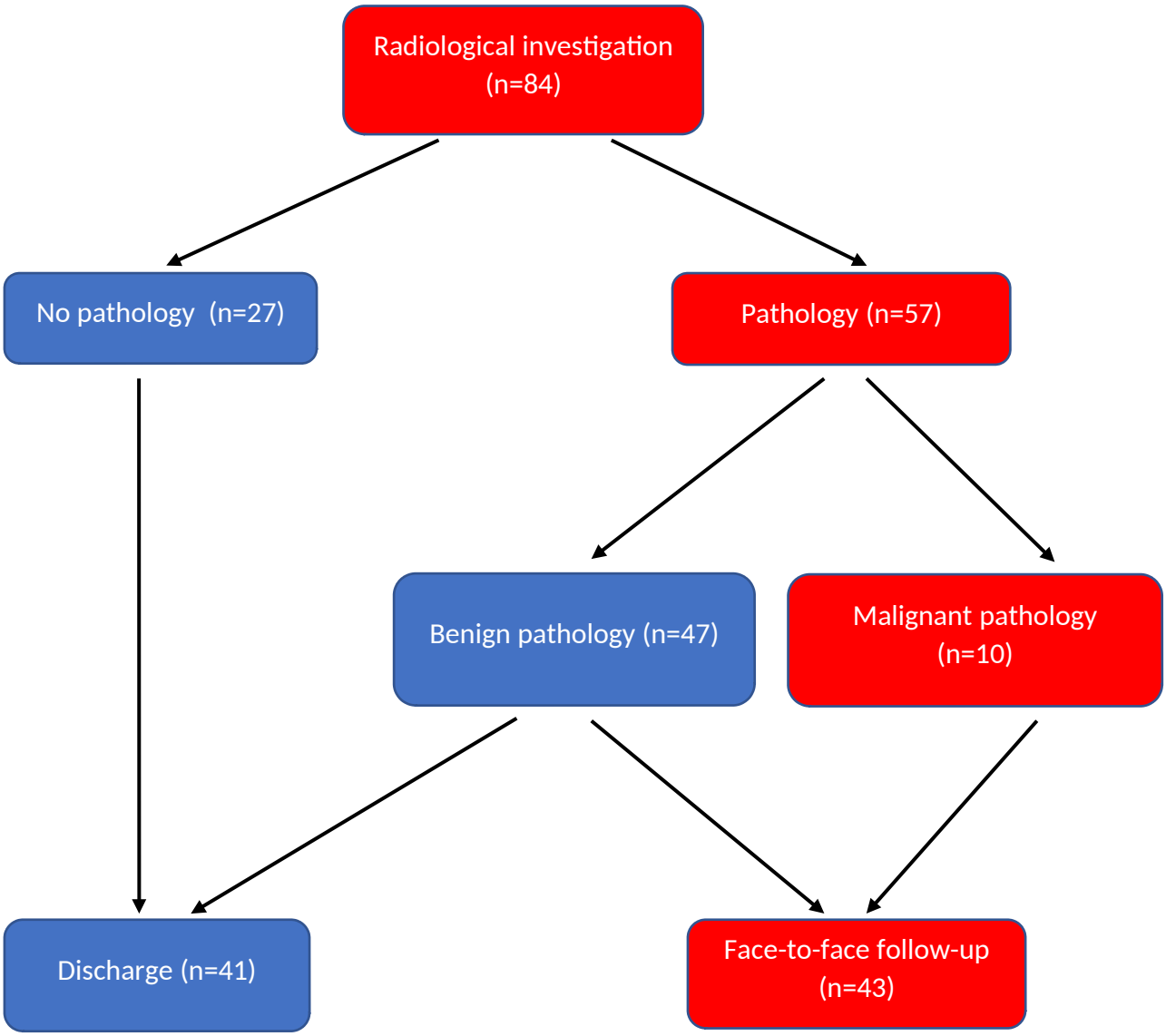

Figure 2. Results and outcomes from the pilot TnT model.

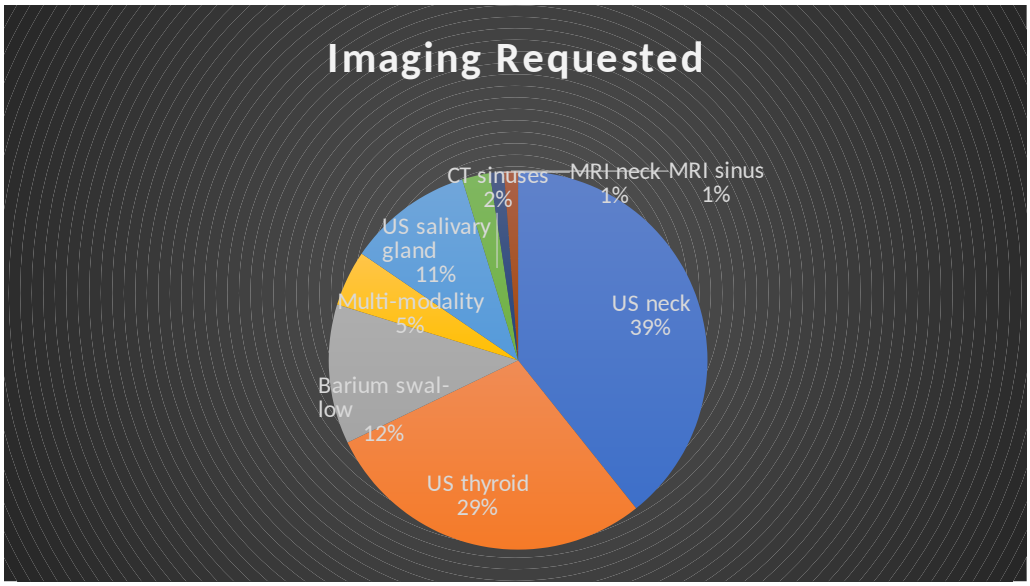

Figure 3. Breakdown of imaging requested via the TnT model.

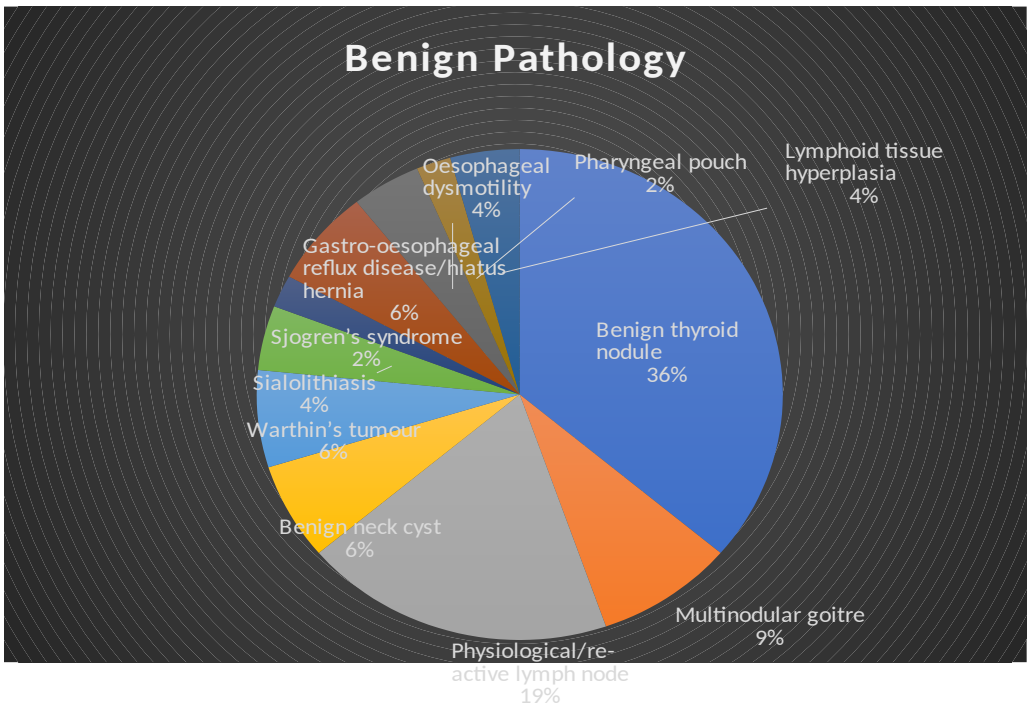

Figure 4. Breakdown of benign pathologies encountered via the TnT model.