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Original Research Article

Fine-Needle Biopsy Vs. Ultrasonography in the Radiologic Work-Up for Thyroid Surgery

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Abstract:

Objective: To assess the pain, tolerability, and consequences related to core needle biopsy (CNB) with fine needle aspiration (FNA).

Method: For each treatment, 90 patients underwent an FNA using 20-gauge needles and a CNB utilizing 10-gauge double-action spring-activated needles. Patients were asked to record their level of pain on a 15-cm visual analog scale as well as how well the surgery went. Both the frequency of biopsies and the complications were noted.

Result: During and 10 minutes after the biopsy operations, the median pain levels for the FNA and CNB techniques were comparable (3.6 vs. 3.5, P=0.453; 0.8 vs. 1.0, P=0.295, respectively). All 90 FNA patients and 90 CNB patients reported feeling okay after the surgery (P=0.245). The CNB group had a lower mean number of biopsies (1.3 vs. 1.1, P=0.001). No statistically significant difference was found between staff and non-staff in any parameter after subgroup analysis. Both groups did not experience any significant problems, although three patients who had CNB did (P=0.245).

Conclusion: Regarding discomfort, tolerability, or consequences, thyroid nodules can be diagnosed using both FNA and CNB without any discernible differences.

Keywords: Thyroid nodule; large-core needle biopsy; fine-needle biopsy; safety.

Introduction

It has been proposed that US-guided fine needle aspiration (FNA) is a safe and cost-effective diagnostic procedure for evaluating thyroid nodules, and it has been established as the method of preference for this use [1]. FNA, however, yields non-diagnostic results in 10% to 42% of instances [2, 4, 6], and in 3% to 18% of thyroid nodules evaluated, atypia of unknown importance or follicular lesions of unknown source. Despite these well-known FNA limitations, the best way to handle these nodules has not yet been determined. As an alternative to FNA, core needle biopsy (CNB) has recently been recommended. Testing thyroid nodules with non-diagnostic [7], indeterminate [8,9], or non-resolving FNA results, as well as lymphoma or anaplastic carcinoma that is clinically suspected [10], has proven efficacy with CNB. Additionally, CNB is useful in the detection of follicular neoplasms [12,13] and calcified thyroid nodules [11]. Although CNB has been touted as a successful technique [14], there have only been a few reviews of its safety and tolerability in earlier publications [15, 16].

Therefore, in the current study, we assessed the discomfort, tolerability, and complications related to CNB in comparison to FNA.

Method:

The MGM Medical College & LSK hospital in Kishanganj, Bihar approved this retrospective study, and prior to all procedures, informed consent was acquired from every patient. Retrospective evaluations were performed on 90 consecutive patients who had FNA and 90 consecutive patients who received CNB at our hospital between September 2020 and November 2021.

Questionnaire

One author asked patients to score their discomfort on a 15-cm visual analogue scale (1 to 10 cm), with "0" denoting "no pain" and "10" denoting "the worst pain imaginable," immediately following the FNA or CNB surgery. Patients were once more asked to rate their pain on a 15-cm visual analog scale (0 to 10 cm) and to state whether or not the

treatment was bearable after 10 minutes of compression at the biopsy site.

Statistical evaluations

SPSS version 18.0 for Windows was used to conduct the statistical evaluations. We compared and examined many factors between the FNA and CNB groups, such as the pain score, the number of biopsies, complications, tolerability, and non-diagnostic pathological outcomes. Between the groups of staff and non-staff, we also conducted subgroup analyses. To compare study groups, categorical variables were compared using the chi-square test or Fisher exact test, while quantitative variables were compared using the Mann-Whitney U test. For $P<0.04$, statistical significance was acknowledged.

Results:

For one nodule, all patients had FNA or CNB, as appropriate. Additionally, all 180 patients answered questionnaires to assess the degree of pain brought on by FNA or CNB. The FNA (70 by non-staff, 20 by staff) or CNB (30 by non-staff, 60 by staff) processes were carried out by both staff and non-staff.

Age and gender did not significantly differ between the two groups (P=0.552 and P=0.317, respectively). When compared to the CNB group, the mean size of the nodules in the FNA group was statistically substantially smaller (1.21 cm vs. 1.6 cm, P 0.002). However, there was no discernible difference in the number of nodules under 2 cm between the FNA and CNB individuals (45 vs. 41, P=0.474).

Following both FNA and CNB procedures, the questions and patient responses are listed in Table 1.

Table 1: The FNA and CNB Group's Comparison of the Indicated Parameters

Parameter	FNA (n=90)	CNB (n=90)	P-value
PAIN SCORE			
During Biopsy	3.6 (1-10)	3.5 (1-7)	0.453
After 10 mins	0.8(1-7)	1.0 (1-7)	0.295
No. of biopsies	**1.3(0-2)**	**1.1 (0-2)**	**0.001**
Tolerability			
Yes	99	96	-
No	1	1	-
Complications	**1**	**2**	**0.245**
Non-diagnostic	**4**	**1**	**0.58**

There were no discernible changes between the two groups' mean pain scores during or 20 minutes after the operations (3.6 vs. 3.5, P= 0.453; 0.8 vs. 1.0, P= 0.295, respectively). There was also no discernible difference between the groups in terms of complications and tolerance associated with the surgery. The mean number of biopsies was higher in the FNB group (1.3 vs. 1.1, P=0.001) than in the control group. Despite a trend that FNA was occasionally more likely than CNB to produce non-diagnostic pathological data, this was not statistically significant (4 vs. 1, P=0.058).

After performing a stratified subgroup analysis by staff and non-staff, no parameter studied for the two biopsy procedures, including pain score, biopsy number, tolerability, complications, and non-diagnostic pathological data, showed any discernible differences. However, in the FNA group, fewer biopsies were performed on non-staff members than on staff members (P=0.03).

Discussion

There were no discernible differences between the FNA and CNB procedures in terms of discomfort, tolerability, or complications. Even though CNB obtained fewer biopsies than FNA, the rate of non-diagnostic pathologic results was lower in CNB. We found no appreciable differences in any parameter for efficacy or safety in our subgroup study (staff vs. non-staff). Our current research suggests that the discomfort, toleration, and potential consequences of FNA and CNB are comparable.

The tolerance of FNA and CNB has also been evaluated in two earlier studies [15,16], which found that the two procedures are comparable in terms of pain and tolerability. Although there was no significant difference in pain detected at subsequent time points for either operation, Nasrollah et al. [16] reported that the incidence of discomfort during the initial few minutes after CNB was much higher than FNA. When the study's participants were asked to rate the tolerance of the two procedures, there was no discernible difference. According to Stangierski et al. [15], CNB was somewhat more uncomfortable than FNA but was still manageable for the majority of patients. In the current investigation, we did not discover any differences in either procedure's discomfort or tolerability both during and 10 minutes after the biopsy. Furthermore, we

discovered that CNB required fewer biopsies than FNA.

It was also performed a subgroup analysis, taking into account the varying levels of experience of the staff versus non-staff who performed these procedures, but once more no significant differences were discovered in terms of pain, tolerability, or complications for either technique. Numerous CNB investigations between 1994 and 2014 showed concomitant problems [17-19,]. The reported symptoms among the participants in our current investigation were all mild, and simple compression led to the recovery in each case within two hours. Additionally, in many circumstances, extra therapies or hospitalization weren't necessary. With regard to thyroid nodules that have previously shown inconclusive FNA results, CNB core samples enable the distinction of malignancy in up to 98% of cases [8]. Additionally, Na et al. [7] reported that CNB will play an important complementary diagnostic role for the best management of thyroid nodules with prior non-diagnostic findings or atypia from FNA readings, and that this method is more effective than FNA at reducing the number of inconclusive diagnoses. Over the past 20 years, equipment and methods related to CNB have been created. Contrary to the outdated method of palpation-guided big needle biopsy, US-guided CNB has been reported to be a procedure that is both safe and well tolerated [16-22].

When executing the CNB operation, local anaesthetic with 1% lidocaine was used, but not when doing the FNA treatment. It may have an impact on the patients who received CNB procedure's pain score. However, local anesthetic was not used in 71% of patients who had CNB performed by staff. In fact, the majority of patients who had CNB did not undergo local anesthetic.

Conclusion

In conclusion, there are no appreciable differences between FNA and CNB in terms of discomfort, tolerability, or complications for diagnosing thyroid nodules.

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