Fine-Needle Aspiration Biopsy: Is Anesthesia Necessary? Part Deux

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Abstract

Objectives: The pain associated with fine needle aspiration biopsy (FNAB) is generally compared to that of venipuncture. However some patients’ perception of pain may be significantly greater. A previous study found some benefit to use of anesthesia in selected FNAB patients. The current study reports on further experience in use of anesthesia in patients undergoing FNAB.

Study Design: Prospective study of 147 patients undergoing FNAB. Patients randomly assigned into one of three study groups.

Methods: In group 1 no anesthesia was used. In group 2 topical ethyl chloride spray, and in group 3 use of infiltrative anesthesia into the local FNAB site.

Results: There were no statistically significant differences among the groups in the level of pre-FNAB apprehension (p=0.61), patient perception of pain (p=0.34), or overall patient perception of the procedure (p=0.18). As noted previously treated head and neck cancer patients.

Conclusions: Several clinical caveats have emerged. In the nervous patient, anesthesia--particularly in the form of ethyl chloride anesthesia is beneficial. Lidocaine infiltration should be used with caution in smaller masses as it may obscure the mass.

INTRODUCTION

Fine-needle aspiration biopsy (FNAB) was first described in the medical literature by Kun in 1847. The surgeon and pathologist Sir James Paget and Enchsen favored the technique of FNAB over open biopsy in 1853. The first live and lung FNAB were performed in 1883 by Ehrlin and Leyden, respectively. Martin and Ellis were credited as being the first to perform FNAB in the United States starting in 1926. They described 65 cases over half of which were neck nodes or masses. They advocated the use of a regular 18-gauge needle over previous aspiration inventions. These included: S.J. Mixer’s blunt-tipped trocar sharpened with the bevel on the inside (unknown date), Goeller’s spiral cutting tip trocar for removal of prostate tissue (1910), and Foriker’s use of a dental broach through an 18 gauge needle (1927). Martin and Ellis also give credit to Ward in 1912 for suggesting FNAB of lymph nodes for lymphosarcoma and to Guthrie in 1921 for FNAB in Hodgkin’s disease. In Europe, use of FNAB increased, and the use of smaller needles were employed. In 1931, Mannheim in Berlin used a 1.0 mm diameter needle (approximately 19 gauge) followed by Lopez-Cardoza and Soderstrom using 22 gauge needles or higher in 1954 and 1966, respectively. Frank and Frable describe the introduction of FNAB to the Medical College of Virginia Hospitals in 1972. At its introduction first physician performed 42 aspirations. By 1988 this procedure had grown to over 1,154 aspirations performed by 6 doctors. They contributed this renewed interest in FNAB by United States physicians due to Romanovsky’s stain utilized in Europe offering better clarity than the Papanicolaou’s stain. Meyers and Tempeler further encouraged the use of FNAB in diagnosis of head and neck pathology by otolaryngologists in 1978 with a diagnostic accuracy of 90%.

FNAB is now considered an important procedure for diagnosing head and neck lesions or tumors. It has a high sensitivity and specificity as well as a low false positive and false negative rate. It is cost-effective and safe. The use of smaller needles has increased patient comfort and lowered complication rates. Ultrasonography FNAB is now being advocated for the use of nonpalpable masses or those with cystic components to increase accuracy of FNAB. This procedure is commonly performed in office or less frequently in the outpatient surgery setting. Patients requiring anesthesia for FNAB include anoxia, low-pain tolerant, pediatric, repeat FNAB, and previously treated head and neck cancer patients.

The use of anesthesia before FNAB has been a topic of discussion as to whether it adds to or eases patient discomfort, or makes no significant difference. Kim and colleagues study reported more frequent higher pain scores with patients receiving local anesthesia before FNAB. Another study using needle free anesthesia report improved patient comfort compared to control. Finally, having experience performing FNAB lends to better results when compared to less experienced physicians. Accordingly the purpose of this study was to further assess the utility of anesthesia in patients undergoing FNAB. Our hypothesis before beginning this study was that there would be no statistical significance to indicate the use of anesthesia on all patients.

METHODS

One hundred forty-seven patients were selected for FNAB. Informed consent was obtained for all patients participating in the study. The risks, benefits, and alternatives were explained in detail. These patients were randomly assigned to three different groups. Each group was either treated solely with no anesthesia, topical ethyl chloride spray, or 1% lidocaine injection (Table 1) prior to FNAB. In the 1% lidocaine group injection was carried out with a tuberculin (27 gauge) needle. The average quantity used was 0.1 ml. The locations biopsied are shown in Table 2.

The physician performing the procedure rated the ease of procedure as easy, moderate, or difficult. Any complications encountered were recorded. The results of the FNAB were also categorized as diagnostic or non-diagnostic. After the procedure a nurse independently assessed the pre-FNAB apprehension of the patient with a questionnaire (Not nervous, somewhat nervous, very nervous). Second, the patient’s pain was assessed with a questionnaire (not painful, somewhat painful, or very painful). Last, the patient was asked to rate the overall impression of the FNA as not at all, tolerable, or worse than I thought. The physician was not present when the nurse questionnaire was taken. Results of physician and patient assessment are listed in Table 3.

The analysis of variance (ANOVA) was used to correct for any statistical significant variance between the three groups. The analysis of covariance (ANCOVA) was used with age as the covariate. This adjusted for any effects age might have had on treatment conditions in the ordinal response measures. A generalized linear model for a binary response variable was used to describe the pre-FNAB apprehension as a covariate in the models without age as a covariate. We failed to find statistical significance among the groups in the ease of the FNAB diagnostic outcome, level of apprehension, perception of pain, or overall impression of the procedure.

RESULTS

The results failed to indicate statistically significant differences among groups in terms of the ease of the FNAB (p=0.48) in the three main sites (thyroid, parotid, or neck) or the FNAB being diagnostic or not (p=0.72). Only one complication was noted, in the topical group, out of 147 total FNAB. The patient had minimal swelling from the FNAB located near the common carotid artery after a thyroid FNAB. The patient was treated conservatively, observed in clinic for any acute changes, and subsequently sent home with no further complications. Results also failed to indicate any significant differences among groups in the level of pre-FNAB apprehension (p=0.53), the patient perception of pain associated with the FNAB procedure (p=0.18), or the patients’ overall impressions of the procedure (p=0.32). As noted in Table 1, there was an unexpected statistically significant difference in the mean age of the 3 study groups. Accordingly, age was included as a covariate in the models without age as a covariate. We failed to find statistical significance among the groups in the ease of the FNAB diagnostic outcome, level of apprehension, perception of pain, or overall impression of the procedure.

DISCUSSION

Our results confirmed our hypothesis in support of the fact that most patients will not benefit from anesthesia before FNAB. FNAB is convenient and cost-effective to the patient because this procedure is well tolerated in an outpatient clinical setting. It is a key tool in helping the physician in the decision making process. FNAB is highly sensitive and specific. This study is a follow-up to the initial study presented with 75 patients in 1999. As the study size doubled but again failed to show statistical significance or difference of anesthesia alleviating overall apprehension or pain in the previous study. There were no operator differences in the ease of FNA in the 3 sites (thyroid, parotid, neck) (p=0.48). As a general rule, the smaller the mass size the greater the difficulty in performing the FNAB. The harder it is to perform the FNAB the greater potential for discomfort on the patient’s part.

Ultrason-guided (US) FNAB is another increasingly important diagnostic evaluation tool being used by otolaryngologists. US FNAB is useful in getting solid diagnostic pieces of tissue for those masses that are small, non-palpable, or a mix of solid and cystic components. Thyroid US biopsies are the most commonly performed. In one study, 376 thyroid FNABs were reviewed and reported 20% more accurate results and 7.1 percent decreased incidence of non-diagnostic specimens.

With any procedure performed, the physician should attempt to decrease anxiety. Taking all the “unknowns” of the procedure by answering questions and explaining in detail the procedure in a stepwise fashion can alleviate fears. Having family members present to comfort the patient is helpful. Finally, we utilize a brochure and allow the patient to return for the FNAB if he/she wants to schedule the FNAB office visit. Clinical judgment of each individual case may necessitate the need for general anesthesia for the overly anxious or pediatric patient. In conclusion, anesthesia is not necessary for the general population but particular cases may warrant its use. In the nervous patient topical ethyl chloride spray is helpful. The use of xylocaine should be utilized with caution in patients with small masses as it tends to obscure the mass and makes FNAB more difficult.

REFERENCES