ORIGINAL ARTICLE

VALUE OF RAPID ASSESSMENT CYTOLOGY IN THE SURGICAL MANAGEMENT OF HEAD AND NECK TUMORS IN A NIGERIAN MISSION HOSPITAL

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Abstract: Background. Fine-needle aspiration (FNA) or touch preparation with rapid assessment is a valuable diagnostic tool with a reported accuracy of diagnosis similar to intraoperative frozen section consultation. The Nigeria Christian Hospital partners with health care professionals from the United States to provide surgical care for rural residents of Aba, Nigeria. Frozen section diagnosis is impractical in this setting because of very limited resources. Therefore, intraoperative rapid assessment FNA or touch preparation to guide surgical management was performed on all mass lesions, and the results were evaluated.

Methods. FNA was performed just before surgery using a 22-gauge needle attached to a 10-mL syringe and/or an intraoperative touch preparation was performed on biopsies of lesions that failed to yield cellular aspirates. Smears were prepared and stained with hematoxylin and eosin, and an immediate diagnosis was rendered. Tissue samples from the same resected/biopsied cases were fixed in 10% formalin and later transported to Vanderbilt University Medical Center Department of Pathology for processing. Cytologic and histologic correlations were then performed.

Results and Conclusions. More than 100 patients underwent surgery for head and/or neck masses during the 2-week periods between November 2002 and November 2003. Of these patients, 98 had either preoperative FNA and/or intraoperative touch preparation performed. Twenty-seven patients were male and 71 were female; the ages ranged from 2 months to 70 years.

Sites sampled included the following: thyroid (n = 40); facial/jaw area (n = 19); parotid/submandibular gland (n = 13); scalp/skull region (n = 7); cervical lymph nodes (n = 5); neck (n = 5); other (n = 4); supravacicular lymph nodes (n = 3); and oral cavity (n = 2). On cytologic analysis, there were 79 benign diagnoses, 17 malignant diagnoses, and 2 nondiagnostic samples. A benign versus malignant cytologic diagnosis was accurate in 97 of 98 cases. In conclusion, rapid assessment cytology was invaluable in the surgical treatment of many of the patients.

Keywords: pathology; cytopathology; tumors; aspiration; surgery

Each November, a head and neck surgical team from Vanderbilt University, Nashville, TN, travels to a small remote mission hospital near Aba, Nigeria, and for 2 weeks evaluates patients and performs surgeries as indicated. The hospital has minimal surgical equipment and supplies, minimal laboratory, and no surgical pathology support. The team consists of several surgeons, anesthesiologist, and several nurses. In 2002 and 2003, a pathology resident accompanied the team to provide the support needed for cytologic/pathologic assessment cytology/pathology support. Given the lack of laboratory infrastructure, preoperative
fine-needle aspiration (FNA) and intraoperative touch preparations were the most feasible methods to obtain rapid diagnoses. The data presented here examine the value of rapid assessment cytology in a resource-poor setting.

**PATIENTS AND METHODS**

The supplies transported to Nigeria included a microscope, hematoxylin and eosin stains, glass slides and cover slips, plastic Copeland jars, 22-gauge needles, and 10-mL syringes. A small area of the operating room was used for preoperative examination of patients to perform FNAs and intraoperative touch preparations, stain slides, and perform microscopic examinations. Preoperative FNA or intraoperative touch preparation was performed in 98 patients (Figure 1). Preliminary diagnoses were rendered on all cases. A tissue sample from most specimens was preserved in small formalin biopsy containers. These samples were transported to a modern facility where histologic analysis was performed. A fully trained and certified pathologist then compared the initial cytologic diagnoses with the final histologic diagnoses.

**RESULTS**

All cases were classified into 1 of 5 categories depending on the level of diagnostic certainty at the time the FNA/touch preparation was performed (Figure 2). In 10 of 98 cases, only a benign or malignant diagnosis was rendered. Additional information in the form of a differential diagnosis was included in 60 of the cases. In 26 cases, a definitive diagnosis was made on cytologic analysis (Table 1). Of these, 1 case proved to be false-negative on histologic review. Two cases were cytologically nondiagnostic.

**DISCUSSION**

Rapid assessment FNA and touch preparation cytology were used for tissue diagnosis during the last 2 surgical mission trips, and the data were reviewed. This method of diagnosis proved successful in several respects. First, all the needed equipment and supplies were easily transported...
in a minimal amount of space and set up with ease. Second, diagnostic accuracy was similar to that of frozen section. Last, and perhaps most important, the diagnosis rendered was invaluable in guiding the surgical treatment of many of these patients.

Small mission hospitals in remote settings have few resources to support highly specialized surgeries. The rural populations served by many of these hospitals rely on specialists visiting from developed countries. In many cases, decisions on management and treatment may successfully rely on clinical judgment alone, without ancillary tests and procedures. However, the proper surgical treatment in many circumstances depends on the preoperative or intraoperative diagnosis as well as the clinical/pathologic stage. Preoperative biopsy histology and/or intraoperative frozen section, although ideal, are not feasible in such a setting.

<table>
<thead>
<tr>
<th>Tissue type</th>
<th>Benign vs malignant</th>
<th>Benign with differential diagnosis</th>
<th>Malignant with differential diagnosis</th>
<th>Benign definitive diagnosis</th>
<th>Malignant definitive diagnosis</th>
</tr>
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<tbody>
<tr>
<td>Thyroid</td>
<td>0</td>
<td>32</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Soft tissue</td>
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<td>10</td>
<td>2</td>
<td>4</td>
<td>0</td>
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<tr>
<td>Salivary</td>
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<td>3</td>
<td>1</td>
<td>7</td>
<td>1</td>
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<tr>
<td>Bone + cartilage</td>
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<td>5</td>
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<td>0</td>
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<td>0</td>
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</table>

Table 1. Level of diagnostic certainty by cytology (number of patients).