Fine needle aspiration cytology of rectal masses

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Abstract

This paper describes the results of transproctoscopic fine needle aspiration cytology in the diagnosis of rectal lesions. Fifty one consecutive patients referred with a presumptive diagnosis of rectal mass were subjected to proctoscopic examination when fine needle aspiration cytology, brush cytology and biopsy samples were taken. Of the 30 patients of malignancy of rectum in whom all the three sampling techniques were applied, the biopsy was positive in 27 (90%), brush cytology in 25 (83.3%) and fine needle aspiration cytology in 29 (96.6%). A combination of fine needle aspiration cytology with brush cytology gave a positive yield in 96.6% while that fine needle aspiration cytology with brush cytology gave a yield of 100%. Fine needle aspiration cytology was most helpful in infiltrative tumours. All 10 patients with secondaries in the pouch of Douglas or rectovesical pouch, and the single patient with submucosal rectal carcinoma were correctly diagnosed at fine needle aspiration cytology. There were no false positive results with fine needle aspiration cytology and no complications were encountered with the procedure.

Endoscopic biopsy and brush cytology are the two most common techniques for diagnosis of malignant lesions of the gastrointestinal tract. A number of workers have recently shown the usefulness of endoscopic fine needle aspiration cytology in achieving a better yield in certain types of malignancies.¹⁻³ Using a bronchoscope the same technique has also been used for sampling paratracheal and subcarinal mass lesions.^{4,5} We have recently described the use of this technique for rectal masses using a proctoscope.⁶ This paper describes our experience in 51 patients subjected to transproctoscopic fine needle aspiration cytology.

Methods

PATIENTS

Fifty one consecutive patients (28 men, 23 women; age 27 to 67 years) with a presumptive diagnosis of a rectal mass were examined two to three hours after a rectal cleansing enema. A digital rectal examination was performed in a knee-chest position when the location and extent of the mass was noted as well as the condition of the mucosa. After adequate lubrication, a sterilised metal proctoscope was then introduced into the rectum, when the characteristics of the abnormality were confirmed. Submucosal masses were once again felt digitally through the proctoscope. Thereafter under direct vision the histol-

ogy/cytology samples were taken from the target area in the following order: (i) fine needle aspiration using a 8 cm, 23 gauge needle attached to a 20 ml syringe, mounted on a suction handle (Cameco, Sweden) by the technique described earlier,⁶ (ii) brushing cytology using a cervical cytology brush (Medscan, Sweden), (iii) forceps biopsy using a standard punch biopsy forceps. In each patient two passes were made with the aspiration needle and two to four smears prepared. Brush cytology and biopsy samples were processed as per the standard practice. The cytology slides were air dried and stained with May-Grunwald-Giemsa stain. They were reported independently by two cytologists unaware of the histopathology report. Thirteen patients (metastases in the pouch of Douglas or rectovesical pouch (10); postradiation stricture (two); and submucosal rectal growth (one)) underwent fine needle aspiration cytology only, while all the three techniques were applied in 38 patients.

Results

The final diagnoses in 51 patients are given in Table I. Twenty eight patients had adenocarcinoma (Fig 1) and one patient each had

TABLE I Final diagnosis in 51 patients

Lesion	n
1 Malignancy of rectum (30)	
(a) Adenocarcinoma	28
(b) Squamous cell carcinoma	1
(c) Malignant melanoma	1
2 Metastatic deposits (pouch of Douglas or the rectovesical pouch) (10)	
(a) Carcinoma of stomach	5
(b) Pancreatic carcinoma	4
(c) Oesophageal carcinoma	1
3 Rectal polyp (4)	
(a) Adenomatous polyp	2
(b) Juvenile polyp	2
4 Solitary rectal ulcer	3
5 Post radiation stricture	2
6 Carcinoma of prostate	1
7 Tuberculosis of rectum	1

Figure 1: Fine needle aspiration smear showing clumps of cells in glandular pattern with prominent nucleoli and moderate amount of vacuolated cytoplasm; features of adenocarcinoma (MGG).

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Figure 2: Fine needle aspiration smear of the patient with malignant melanoma. The smear shows discrete cell population with inclusion like nucleoli and pigmented cytoplasm (PAP).

Figure 3: Fine needle aspiration smear showing squamous cell carcinoma (MGG).

malignant melanoma (Fig 2) and squamous cell carcinoma (Fig 3) of the rectum. The carcinoma of rectum was polypoidal (18 patients), ulcerative (seven), infiltrative (three) or submucosal (one), while the solitary malignant melanoma was hard, nodular and greyish-black. Of the 41 patients proved to have a malignant lesion, 30 had been subjected to all the three techniques. In these patients the biopsy was positive in 27, brush cytology in 25 and fine needle aspiration cytology in 29 patients. Table II gives the break up of patients with discordant reports. The sole false negative yield with fine needle aspiration cytology was in a patient with ulcerative growth. A combination of all the three techniques (Table III) gave a definitive diagnosis in all the 30 patients. There was no disparity between the histological and cytological diagnoses and there were no false positive results with any of the techniques.

Transproctoscopic fine needle aspiration cytology was positive for malignancy in all the 10 patients with deposits in the rectovesical pouch or the pouch of Douglas, and the aspirate showing features of adenocarcinoma. The origin of the primary tumour could not be detected in any of them. The metastatic deposits were clearly felt on digital examination and an irregular submucosal lesion was seen at proctoscopy in all

patients. In none of the 10 patients with a benign disease, any comment could be made about the nature of the lesion, at fine needle aspiration cytology or brush cytology.

Discussion

Fine needle aspiration cytology has been increasingly used in the last two decades as a simple, safe and quick method to achieve morphological diagnosis. An adaptation of fine needle aspiration cytology has been used by endoscopy for the diagnosis of bronchopulmonary^{4,5} and oesophagogastric¹⁻³ malignancies. It has been felt that endoscopic fine needle aspiration cytology has a higher sensitivity compared with other techniques as it can sample infiltrative and submucosal tumours more successfully.^{3,5,6} Our results are in accordance with these observations. The positive yield (96.6%) with transproctoscopic fine needle aspiration cytology was higher than with brush cytology (83.3%) or biopsy (90%) in our patients. Combining the results of fine needle aspiration cytology and biopsy could establish the diagnosis in all the 30 patients with a malignancy involving the rectum (Table III). A combination of biopsy and brush cytology had a negative yield in two (67%) of the patients.

False negative results with endoscopic biopsy may be caused by infiltrative tumours,^{7,8} ulcerative tumours covered with necrotic debris,^{7,8} and submucosal growths.⁹ Brush cytology can increase the diagnostic yield in infiltrative tumours and obstructing lesions that prevent the passage of the endoscope to the desired site.¹⁰ Submucosal tumours and growths covered with necrotic material, however, still pose a diagnostic problem. Proctoscopic fine needle aspiration cytology is likely to have a better sensitivity in infiltrative and submucosal tumours and may sample the fungating growths better. The number of patients with infiltrative and ulcerative growths was quite small in the present study but all three infiltrative tumours were correctly diagnosed at fine needle aspiration cytology. The single patient with submucosal tumour of the rectum had a hard, nodular growth correctly diagnosed by fine needle aspiration cytology.

This study shows the usefulness of fine needle aspiration cytology for metastatic deposits in the pouch of Douglas or the rectovesical pouch. Hitherto such lesions were difficult to sample. At proctoscopy these deposits can be visualised directly and palpated as well, thus guiding the

TABLE II Type of growth and results of different techniques in patients with discordant reports

Type of growth	Biopsy	Brush cytology	Fine needle aspiration cytology
Infiltrative	—	—	+
Infiltrative	—	—	+
Ulcerative	—	+	+
Ulcerative	+	—	+
Ulcerative	+	+	—
Polypoidal	+	—	+
Polypoidal	+	—	+

+/- positive/negative for malignancy.

TABLE III Diagnostic accuracy of combination of techniques in 30 patients

	Positive	%
Biopsy + brush cytology	28	93.3
Brush cytology + FNAC	29	96.6
Biopsy + FNAC	30	100
Biopsy + brush + FNAC	30	100

FNAC: Fine needle aspiration cytology.

aspiration needle. We were successful in all the 10 patients in whom the technique was applied. It was, however, not possible to comment on the origin of the tumour. This has also been the experience of other workers who have done fine needle aspiration cytology of intrapelvic organs.¹¹ These workers have sampled the suspect area through the transvaginal or transrectal route using Franzen's needle. When using the Franzen's technique, originally described for prostatic tumours,¹² the tip of the index finger is used to guide the aspiration needle. With the transproctoscopic technique, however, the suspect area is both seen and felt and the needle insertion into the tissues is made under direct vision.

The role of fine needle aspiration cytology in benign lesions lies primarily in excluding malignancy. Solitary rectal ulcer is known to be confused with a malignant process.¹³ A combination of biopsy, brushing and fine needle aspiration cytology can exclude the latter possibility to a reasonable extent as was our experience. Tuberculosis of the rectum, though rare, can also pose a diagnostic problem. In the solitary patient with ulcerohyperplastic tubercular lesion of the rectum, the biopsy showed epithelioid granulomas with caseation while both the cytological techniques (brushing and fine needle aspiration cytology) had shown only benign columnar cells. The negative yield with fine needle aspiration cytology was in all probability because of inadequate sampling.

There are certain limitations of the use of fine needle aspiration cytology. First, this technique cannot be used for typing benign lesions. Second, the fine needle aspiration cytology report of no evidence of malignancy has to be seen in the total context of the patient. The false negative yield of fine needle aspiration cytology of different organs in the body ranges from 1.8% to 10%.¹⁴⁻¹⁷ Thus a negative aspirate does not necessarily rule out the possibility of a malignancy. Third, the application of the technique of fine needle aspiration cytology in polypoid lesions leaves much to be desired. Though fine needle aspiration cytology correctly diagnosed the absence of malignancy in all four of our patients, this technique may be inadequate in such lesions. If the stalk alone harbours a malignant focus, the aspiration needle may not reach that area and fine needle aspiration cytology will get a false

negative yield. Moreover, the malignant cells aspirated from a polyp may represent only a carcinoma *in situ*. Even otherwise also, reliable diagnosis of malignancy in polypoid lesions in colorectum requires architectural evidence of invasion which can be seen only in solid polypectomy or biopsy specimens.¹⁸

We conclude that proctoscopic fine needle aspiration cytology is extremely useful in sampling submucosal and infiltrating tumours, while brush cytology has an adjunctive role in stenotic lesions.

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