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CORRESPONDENCE

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The role of breast fine needle aspiration during and post-COVID-19 pandemic: A fast and safe alternative to needle core biopsy

1 | INTRODUCTION

The coronavirus disease 2019 (COVID-19) has spread all over the world, affecting most countries to varying degrees. As of 10 July 2020, there were more than 12 million people infected worldwide and over 500 000 casualties.[1] The way the pandemic played out in certain countries, such as the first wave in Italy, have shown how taxing this virus is for healthcare systems and how dire the situation can become when they are overwhelmed.[2] This is true not only for those directly or indirectly affected by the viral infection. Much attention has been focused on the economical consequences of the pandemic and the measures taken to control it.[3-6] However, a few reports have also focused on the consequences for those affected by other severe pathologies.[2,7-10] Center for Disease Control data show that excess deaths, defined as the difference between observed numbers of deaths and expected numbers, excluding those attributed to COVID-19, have increased in the USA during the pandemic when compared to previous years, particularly in heavily affected areas such as the state of New York.[11]

This may, at least in part, be attributed to the many constraints COVID-19 places on health services, both public and private. Severe cases often require access to ventilators and well-equipped intensive care units.[12] Given the insufficient capacities in many countries and hospitals, units previously used for surgical and diagnostic procedures were converted to impromptu COVID-19 units. Healthcare personnel were diverted to these units, replacing their usual duties with COVID-19 patient treatment and triage.[13] The consequence is a reduced capacity for diagnostic and therapeutic procedures of unrelated pathologies.[2,7-10] This capacity was further decreased by the need to adapt procedures and provide adequate personal protection equipment to healthcare professionals, since these patients may be harbouring the disease and be contagious while remaining asymptomatic.[13] Furthermore, patients themselves may be avoiding looking for healthcare even when in need, for fear of contracting COVID-19 infection.[14]

Data show that this will invariably result in delays and increased waiting lists for diagnostic and therapeutic procedures of vital importance, which will be felt for years to come.[15,16]

2 | FINE NEEDLE ASPIRATION BIOPSIES OF THE BREAST

Some of the patients affected by these delays were those with suspicious breast lesions detected clinically or through imaging studies. To recover from this situation, and reduce the increase in mortality and morbidity, innovative and unconventional strategies will necessarily have to emerge. All patients with suspicious lesions need pathological confirmation of malignancy in order to be treated, and diagnostic procedures have been deemed high priority by several international organisations.[17-19] As already established, many of these diagnostic procedures have been delayed, resulting in procedure backlogs. Furthermore, given that recommendations have been issued to suspend imagological screening examinations of the breast, these backlogs are bound to increase as the pandemic is controlled and procedures resumed.[20]

Current practice guidelines recommend that the diagnosis of suspicious breast lesions classified radiologically as BIRADS 4 and 5 should be made using core needle biopsies (CNBs).[21,22] When compared to fine needle aspiration biopsies (FNABs), CNBs have some advantages, such as enabling the assessment of suspicious microcalcifications detected by mammography, distinguishing in situ from invasive lesions and providing material for performing theragnostic biomarkers, enabling personalised therapy.[23]

However, FNABs of breast lesions have a long history in western medicine, and their diagnostic value cannot be understated. When coupled with ultrasound and rapid on-site evaluation, they have been shown to be successful in the diagnosis of both palpable and non-palpable ultrasound-detectable breast lesions. Whereas CNBs are expensive, complex procedures, with an increased risk of complications, FNABs are quick to perform, cost-effective and minimally invasive.[24,25]

In the context of the COVID-19 pandemic, these features seem advantageous. By resorting to FNABs, clinicians may be able to save time and resources, which may be very limited at this time. However, even if they are less expensive and quicker to perform, these advantages would be negated if a CNB is still needed to obtain adequate material for the confirmation of invasion or to enable ancillary testing. We would argue, however, that these problems can now, more

than ever, be overcome. Firstly, ancillary tests have been shown to be viable on cytological material in the context of breast cancer, either directly performed on smears or cell-blocks.[26] Secondly, the International Academy of Cytology recently developed the Yokohama System for Reporting Breast Fine-Needle Aspiration Biopsy Cytopathology.[27] Similarly to other standardised reporting systems in cytology, the Yokohama system divides breast FNAB diagnoses into five categories, each with known and defined risks of malignancy: insufficient for diagnosis, benign, atypical, suspicious for malignancy and malignant.

The risks of malignancy and reproducibility of criteria for each of these categories have recently been validated in a meta-analysis.[28] In fact, looking at other organ systems such as the thyroid, these standardised systems have long enabled a successful clinical management of tumoral lesions.[29,30] Furthermore, although a cytopathologist following the Yokohama system cannot definitively tell apart high-grade ductal in situ carcinoma from an invasive carcinoma, they should be able to differentiate these lesions from low-grade ductal in situ carcinomas and other low-risk proliferative lesions of the breast. Clinical management of high-grade ductal in situ carcinoma is very similar to the management of invasive carcinoma, allowing diagnosis and surgical management without core biopsy.[27] When a diagnosis of low-grade ductal in situ carcinoma is made (in the atypical or suspicious categories), a biopsy may be necessary. However, a recent series from an Italian reference centre has shown that, when performed by experienced cytopathologists following the Yokohama system, the majority of diagnoses are either benign or malignant.[31]

This would reduce the burden of CNB procedures for surgeons and radiologists alike, enabling the screening of more patients in the available time, which is of particular importance in the context of this pandemic, when resources are limited.

3 | BIOSAFETY

One could also argue that, given the minimal invasive nature of the FNAB procedure, the risk of infection from a asymptomatic COVID-19 patient should be low, and even lower when compared to a CNB procedure, which may involve more personnel and time to perform. However, biosafety hazards in cytology are not limited to the aspiration procedure itself, but also involve transport, preparation and processing of specimens such as air-dried smears. Those issues have been raised in recent publications.[32-34]

For instance, cytopathologists may work in pairs, reducing the time spent on each patient. If possible, after the procedure itself, all sample processing should be performed under a level 2 biosafety hood. However, if this is unavailable or unpractical, FFP2/N95 masks and face shields should be sufficient to adequately protect personnel. Smears can be fixed in ethanol to avoid the generation of aerosols and droplets from these samples downstream. The material obtained through the FNA procedure may also be placed in a liquid medium, such as ethanol, enabling cyto-centrifuge preparations, or formaldehyde, enabling the preparation of cell-blocks.[32-34] These may be prepared using one of the several methods described in the literature.[35]

4 | CONCLUSIONS

COVID-19 is a novel virus that has taken the world by surprise, through its ease of transmissibility, asymptomatic spread and lethality. Health systems have been overburdened and struggled to cope, deferring elective diagnostic and therapeutic procedures. In the case of breast cancer, this has led to a backlog of patients, which will only worsen as imaging and diagnostic activity is resumed. CNBs of the breast have so far been the gold-standard for the diagnoses of breast lesions, given their reliability, reproducibility and accuracy of diagnosis. FNABs, however, are more cost-effective and quicker to perform. Their perceived limitations, such as the lack of a definitive diagnosis and poor interobserver reproducibility have been addressed by the Yokohama system. Furthermore, they have been shown to be able to provide adequate material for ancillary testing.

Pathologists may no longer be used to these samples, but extraordinary times require extraordinary measures. Through the use of the Yokohama system, which has been shown to be reproducible, with good communication with clinicians and image correlation, we believe that FNABs may be a valuable and even essential diagnostic tool for tumoural breast lesions in the world of COVID-19.

KEYWORDS
biosafety, breast cancer, COVID-19, cytology, fine-needle aspiration

CONFLICT OF INTEREST
The authors have no conflict of interest to declare.

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