

# Unusual Presentation of a Post-procedural Breast Hematoma: A Case Report

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**Abstract.** *Background/Aim: Hematoma is the most frequent complication after Vacuum-Assisted Breast Biopsy (VABB) in 13% of cases. A direct communication channel with patients eases the diagnosis of VABB complications and ensures treatment at an early stage, as outpatients, in most cases. In 2020, due to the COVID-19 pandemic, we observed a reduction of self-reported postoperative complication leading to delay in the identification of harmful complications, therefore leading to need for more invasive treatment. Case Report: A 50-year-old patient was admitted to the Emergency Department for dry cough, fever, chest discomfort, dyspnea, and slight confusion four days after VABB. Due to the reported symptoms, the patient was sent to our COVID-19 Emergency Department. The COVID-19 swab was negative. Ultrasound revealed a large hematoma at the biopsy site, with active bleeding. Open evacuation with accurate hemostasis was planned with rapid and complete resolution of the clinical symptoms. After surgery, the patient reported that she intentionally avoided admittance in the hospital due to the risk of COVID-19 infection. The patient was discharged in the first postoperative day and maintained in quarantine for 14 days. Conclusion: In the COVID-19 era due to the risk of hospital cross-infections, reduction of patient-doctor communication could lead to misdiagnosis, delay in recognition of procedural complications thus leading to requirement for invasive treatment, hospitalization, while also further multiplying the risk of COVID-19 infection.*

Breast Cancer (BC) represents the most common neoplasia worldwide, affecting more than 2.3 million women yearly (1). Patient tailored treatment encompasses a combination of surgery, medical, and radiation oncology treatment (2-4). Keeping in mind the complexity of BC treatment options, careful diagnostic assessment is imperative to choose for the best treatment strategy for each patient to reduce locoregional (5-7) and distant relapse (8, 9).

Diagnostic assessment requires a complete clinical evaluation, so called triple assessment, which includes physical examination, imaging (mammography and/or ultrasound), and needle biopsy [fine needle aspiration cytology (FNAC), core needle biopsy (CNB), or vacuum-assisted breast biopsy (VABB)] (10).

Among different needle biopsy procedures, VABB gained popularity thanks to the achievement of bigger sampling within a single insertion and lower rate of false-negative results (11, 12). Moreover, VABB procedure allows the complete removal of small benign lesions, especially when smaller than 10 mm (13), representing a safe technique with a low rate of major complications (2.1%) even when performed with larger needles (8 or 11 Gauge) (14, 15). Most common minor complication are represented by hematoma, with an incidence of 13% (16).

In order to identify any early VABB complication, most of the BC Centre facilities developed a telephonic direct communication system between health care providers and patients (17). In our experience, the direct communication system provided diagnosis at presentation or at an early stage, allowing for early conservative treatment, in the majority of cases. In 2020, due to the COVID-19 pandemic, we observed a reduction of self-reported VABB postoperative complications. This reduction could lead to a delay in the identification of harmful complication and more invasive treatment. Hence, we report a case of a patient with post-procedure complication which required surgical exploration due to the deliberately delay of patient hospital admission.

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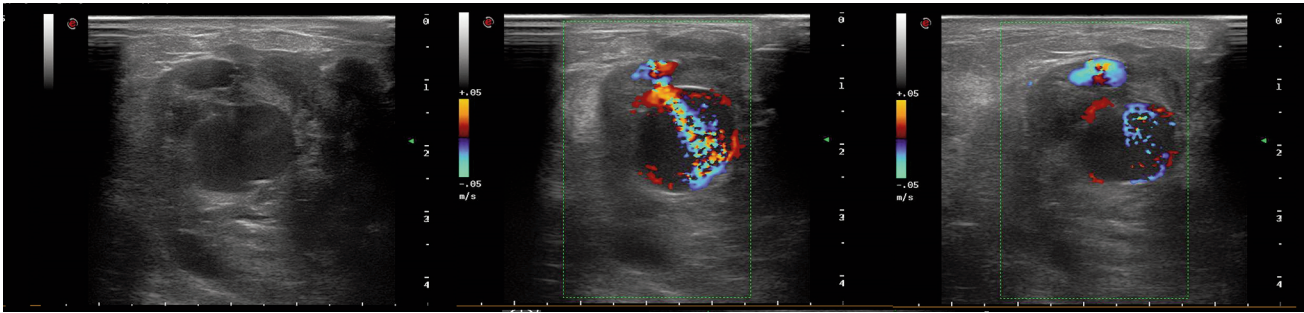


Figure 1. Breast ultrasound. From left to right morphologic ultrasonographic assessment and color-doppler with active bleeding.

## Case Report

In late December 2020, a 50-year-old female patient was admitted to the Emergency Department at our Institution for a worsening dry cough, fever ( $37.5^{\circ}\text{C}$ ), chest discomfort and feeling of pressure associated with shortness of breath, fatigue and slight confusion. Symptom onset dated back to three days earlier. The patient was initially admitted to our COVID-19 Emergency Department.

Oxygen saturation was stable at 99% with  $\text{PaO}_2=85$  mmHg and  $\text{PCO}_2=38$  mmHg. Electrolytes were within the normal limits. Hemoglobin (Hb) levels at admission were 11.7 g/dl with Hematocrit (Ht) of 33.5%. Phlogosis indices were found to be all within normal limits, with C-reactive protein of 5.3 mg/l (N: 0-5.0 mg/l) and conserved leukocyte count. Both diagnostic and confirmatory COVID-19 swabs tested negative.

Chest physical examination did not reveal abnormalities on auscultation or percussion of the thorax. A marked asymmetry of the left breast was described upon inspection. The swelling appeared as non-erythematous and the patient did not complain of localized tenderness other than the aforementioned discomfort. The left breast was tender on palpation. The patient had undergone a VABB of the left breast four days earlier as a monitoring measure of a microcalcification cluster localized at the external-superior quadrant. VABB was performed by Mammotome<sup>®</sup> (Devicor Medical Products, Inc. Cincinnati, OH, USA) with an 8-Gauge needle, stereotaxic technique-guided. Despite not experiencing any immediate complication at the time of the procedure, the patient reported a progressive swelling since post-procedure day 1. The patient was following a prophylactic antibiotic treatment (Augmentin 875 mg/125 mg twice a day, for 5 days) as per protocol and the compressive bandage was congruously in place. The patient reported she intentionally avoided further contacts with the hospital due to the risk of Sars-Cov-2 infection, and only the onset of fever has led to the Emergency Department self-referral.

Emergency ultrasound showed a  $2.5\times 1.6$  cm hematoma and a pulsatile active bleeding of the core biopsy site detected by color-doppler assessment (Figure 1). This finding was associated with a loss of 1 unit of Hb (stable Ht: 33%) and a progressive decline of the general clinical condition. The volume of hematoma as well as the persistence and intensity of the bleeding required an accurate hemostasis of the site, not feasible with an emergency drainage.

Open hematoma evacuation and Argon Beam Coagulator hemostasis were performed. Immediately following the hematoma evacuation, rapid and complete resolution of the clinical symptoms was observed. Postoperative course was uneventful and patients was discharged during the first postoperative day.

During hospital admission, the patient was maintained isolated and surgical procedure was performed in the COVID-19 surgical room because of the prior admission in the COVID-19 Emergency Department. After discharge, due to the aforementioned reason, the patient maintained in quarantine for 14 days and COVID-19 swab test was performed at the end of quarantine, which was negative (18).

## Discussion

The VABB procedure is a safe option to complete the triple assessment of newly-diagnosed breast lumps (14, 15). Major complications encompass bleeding at the biopsy site which does not cease even under manual or bandage compression following the procedure. Dahabreh *et al.* reported the results of eight studies on ultrasound guided vacuum assisted biopsies identifying an hematoma incidence of 13% and a bleeding rate of 2.5% (16).

Schaefer *et al.* reported significantly more bleedings and post-interventional hematomas with 8-gauge-Mammotome<sup>®</sup>-system vs. 11-gauge-Mammotome<sup>®</sup>-system (41.9% vs. 8.4%,  $p<0.001$ ; 35.5% vs. 16.7%,  $p=0.029$ ) while no significant differences were reported regarding the ATECR-systems 9-gauge vs. 12-gauge (26.9% vs. 29.7%,  $p=0.799$ ; 42.3% vs. 43.2%,  $p=0.596$ ) (19). Conversely, Hahn *et al.* did not manage

to define a significant difference between the use of 8 or 11 Gauge needle in diagnostic reliability, nor in hematoma incidence and volume or resolution ( $p=0.2$ ) (20). Zagouri *et al.* reported that clinically significant and subsequently organized hematomas were significantly more frequent in the extended protocol than in the standard protocol (7.5% vs. 3.5%,  $p=0.038$ ) (21), also concluding that the likelihood of hematoma increases proportionally to the amount of intraoperative blood loss, with a plateau being reached at approximately 80 cc (22, 23).

In 2008, Zografos *et al.* indicated the insertion of a Fogarty catheter as an option to limit or prevent the development of hematomas following VAB (24, 25). In 2015, Shao-Mei *et al.* also reported the effect of using a fully inflated Foley catheter after VAB, right at the site of the procedure vs. manual compression, with promising results ( $p=0.002$ ) in hematoma incidence reduction (26).

What made the case of our patient unique was its unusual clinical presentation with symptoms suggestive of a phlogistic process, however, physical examination and laboratory tests failed to show any relevance of the diagnosis, even before the molecular swab was confirmed as negative (27, 28).

We believe such atypical presentation should be attributed to the inflammatory micro-environment developing at the site of the VAB procedure. In 2009, Zografos *et al.* described the analysis of serial venous samples collected from 36 patients prior to, at the end and 1 hour following a stereotaxic VAB in which Interleukin (IL)-1 $\alpha$ , IL-1 $\beta$  and IL-6 levels were measured to assess a potential link to the likelihood of developing a hematoma and its evolution (organization or progression). IL-1 $\alpha$  and IL-1 $\beta$  levels did not exhibit significant changes while IL-6 serum levels trend of above 5.5 pg/ml 1 hour following VAB or of 4 pg/ml increase above the baseline was found to be alarming for hematoma formation (29, 30). Further studies are required to determine a threshold or any other serological marker that could delineate the distinction between hematomas that require further interventions and those that do not (29, 31-33).

Most of all, our case is very representative of the impact of the COVID-19 pandemic on our patients. The fear of contracting the infection led to a lack of communication, a crucial aspect within the system of our Breast Unit (28). All our patients have a direct channel of communication with health care providers, meaning that the most frequent complications such as bleeding and hematomas can be solved at presentation at the outpatient clinic with no need for invasive procedures.

In this case, the patient deliberately avoided reporting her condition due to fear of contracting COVID-19 at our outpatient clinic. Reduction of surgical emergency access with an higher rate of hospitalization, it is a well-known effect of COVID-19 pandemic and this clinical case confirmed previous evidence in larger series (34, 35). In fact, patient self-referred to Emergency Department only when

her clinical condition deteriorated. Due to the symptoms reported, patient after triage was sent to our COVID-19 Emergency Department, multiplying her chances of contracting the infection.

After diagnosis, patient required an open procedure with inpatient admission due to the more advanced phase of hematoma. The delayed presentation led to the need for an invasive procedure to treat a common complication that would have been otherwise treated conservatively. Moreover, due to the first admission in the COVID-19 section, the patient required 14 days quarantine and further COVID-19 swab test at home, impacting on patient's return to daily activities and work. Additionally, due to the cross-infection risk, all health care workers wore personal protective equipment (PPE) to reduce cross infection in oncological frail patients (36, 37).

### Conflicts of Interest

The Authors declare no conflicts of interest regarding this study.

### Authors' Contributions

Gianluca Vanni, Oreste Claudio Buonomo performed the surgical procedure; Domiziana Pedini, Marco Materazzo reviewed literature data, Tommaso Perretta, Chiara Adriana Pistolese preoperative investigation the patient, Domiziana Pedini, Andrea Farinaccio prepared the draft of the manuscript, Oreste Claudio Buonomo was advisor of the surgical procedures, Marco Materazzo, Buonomo Oreste Claudio, Gianluca Vanni reviewed the final version of the manuscript. All the Authors read and approved the final version of the manuscript.

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