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The Worst End of Misinformation – A Case Report of Thyroid Cancer

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Abstract

Introduction: *Clinical records provide an objective and comprehensive form of documentation of a patient's health history, aiming to support accurate, continuous care and communication between healthcare providers. Effective healthcare also relies on patients' ability to understand and report their health status. Health literacy plays a crucial role. When limited, it can lead to delayed diagnoses, poor treatment adherence and misinformation.*

Description: *A 51−yo woman with a medical history of HT, depression, DM, osteoarthrosis, complains to the family doctor of fatigue and lively dreams. OSAS was initially suspected, prompting further investigation. Afterwards, she experienced dizziness and the feeling of "empty head". A head-CT scan revealed small lytic lesions in the occipital bones suggestive of secondary bone metastases. Further diagnostic imaging, including thoracic-CT, identified an asymmetric thyroid gland with a hypodense nodule. The US revealed two nodules, characterized as TI-RADS 4 and 5. At this point, the patient remembered that 15 years ago had the indication to undergo FNA, due to a suspicious thyroid nodule; this was postponed because of her pregnancy status, and then it was never performed. Hurthle cell carcinoma was suspected.*

Conclusion: *This case highlights the complexity involved in healthcare, due to the fragmented medical records and poor inter-system communication. Furthermore, it also emphasizes the importance of promoting health literacy and capacitates patients to actively engage in their own care. The competences defining Family Medicine underscore its unique role in enhancing a longitudinal patient-physician relationship, as well as to advocate a quality healthcare that meets patient's interests and needs.*

Keywords: Electronic Health Record, Economic Burden of Disease, Health Literacy, Diagnosis Delay, Family Medicine.

Introduction

Clinical records are, nowadays, the foundation of modern clinical practice. It represents the legal, ethical, and professional documentation of all relevant clinical data relating to a patient and the care provided over the course of time.

From the earliest known examples, such as the Ebers Papyrus in ancient Egypt (circa 3000 BC), to the contemporary electronic health record (EHR) systems, clinical documentation has evolved in parallel with medical knowledge, technology, and societal expectations [1]. The progressive developments in healthcare and documentation are focused on achieving the fundamental purposes of the clinical records, which are: support patient care, ensure continuity in the care provided, facilitate communication between healthcare professionals, and promote a reliable medico-legal account of clinical decision-making. Initially EHR urged as a tool to digitize medical documentation, nevertheless their functionality has significantly expanded beyond clinical practice. In modern healthcare systems, EHR promises improved accessibility, legibility and data sharing, being also useful for research, data analysis or medical education [2].

However, fragmentation between different information systems, poor interoperability between these or incomplete documentation, may paradoxically compromise care. When information is dispersed across multiple platforms or institutions, clinicians may lack access to critical clinical data, leading to, for example, repeated investigations, delay in diagnosis or increased patient stress. Another factor to consider is the increased costs associated with all statements previously mentioned. These issues are particularly relevant in chronic and complex cases that require a longitudinal follow-up across different levels of care and medical specialities.

Health is defined by the world health Organization (WHO) as a state of complete physical, social and mental well-being. Additionally in the Ottawa Declaration, it is stated that "individuals or groups must be able to identify and realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living.". Therefore, the importance of health promotion and health literacy. The latest defines the degree to which people are able to access, understand, appraise and communicate information to engage with the demands of different health contexts in order to promote and maintain good health across the life-course [3].

Thus, adequate health literacy enables patients to understand their diagnoses, engage in shared decision-making, promote adhesion to treatment plans, and navigate healthcare systems more effectively. Conversely, low health literacy is associated with poorer health outcomes, increased healthcare utilisation, decreased use of preventive services, poor ability to understand and interpret health messages, higher mortality and ultimately higher costs [4]. This is an essential dimension, when it concerns developing a safe and effective healthcare system.

Family Medicine plays a unique role in addressing these challenges. As a specialty, whose competencies are grounded in a comprehensive approach, holistic modelling and person-centred care, Family Medicine is particularly well placed to integrate a patient's clinical history, advocate for the patient's interests and needs within complex systems, and to promote health education. The long-term doctor–patient relationship allows family physicians to contextualise symptoms according to the multiple health determinants (family, social, community) and epidemiological data, maintain a close surveillance, and recognise early undifferentiated stages of disease.

The following clinical case reports a 51-year-old woman whose diagnostic pathway for thyroid pathology was prolonged and complicated by fragmented medical records, delayed follow-up, and cumulative misinformation, involving both the patient and the healthcare system. This case illustrates how system-level issues and limited patient empowerment can contribute to diagnostic delay, increased investigation burden, and potential harm to the patient. It also highlights the critical role of Family Medicine in coordinating care, supporting patients, and striving for value-based and realistic medicine.

Case Description

Patient Background

The patient is a 51-year-old woman, natural from Portugal, who is retired from working as a care home staff, with twelve years of education. She is married, has two descendants, and lives within a nuclear family with her husband and her son. According to the Duvall family life cycle, it is considered a stage VI family (family with young adults leaving home). She reports good social support and stable family dynamics. From her past medical history highlights essential arterial hypertension, diagnosed in 2013; type 2 diabetes mellitus (DM), diagnosed in 2021; major depressive disorder; and osteoarthrosis. Her chronic medication includes nebivolol, azilsartan combined with chlorthalidone, metformin combined with dapagliflozin, rosuvastatin, venlafaxine, and trazodone as needed, if insomnia. To mention that the above diseases are symptomatically and clinically controlled. She practices hydro gymnastics and attends the gym regularly; she is a non-smoker and drinks alcohol, only sporadically on social occasions. Her family history includes mother with arterial hypertension, who died at the age of 62 years-old from pancreatic cancer; father died following a car accident; maternal grandmother with arterial hypertension and type 2 diabetes mellitus.

Initial Presentation

The patient started the surveillance with her current family doctor back in 2016, where the clinical history was collected according to the patient's self-report.

In May 2024, during a programmed appointment for diabetes mellitus and hypertension surveillance, the patient reported a feeling of prolonged fatigue. She described difficulty falling asleep, which improved with trazodone, although she experienced vivid dreams and woke up feeling tired. She also reported restlessness in her legs. On objective examination, her body mass index (BMI) was 34.3 kg/m², with an abdominal perimeter of 105 cm. Blood pressure was 111/65 mmHg and glycated haemoglobin (HbA1c) was 7%. There was no evidence of anaemia or iron deficiency, and thyroid function tests (free T4 and TSH) were within normal limits. The assessment for the current appointment focused on sleep disorder, to which the differential diagnosis proposed were insomnia, obstructive sleep apnoea syndrome (OSAS) or restless leg syndrome. The plan focused primarily on advising for sleep hygiene measures, maintaining trazodone 100 mg as required, and posterior reassessment using the Epworth Sleepiness Scale at a subsequent appointment.

In July 2024, during another programmed appointment, the patient reported snoring and episodes of apnoea witnessed by her husband. She described waking up frightened from vivid dreams, as well as complaints of memory loss and nocturia (two episodes per night). On examination, her weight was 92.5 kg, corresponding to a BMI of 34.4 kg/m². Neck circumference measured 38 cm, and oropharyngeal examination revealed a Mallampati class IV. The Epworth Sleepiness Scale score was 10. A sleep disorder was again assessed, with a suspicion of obstructive sleep apnoea. Sleep hygiene advice was reinforced, and the patient was referred to a Pulmonology appointment for further investigation and evaluation.

Acute Presentation and Investigation

Two weeks after this last appointment, the patient attended an acute disease appointment complaining of dizziness, panic, and a sensation of breathing distress, accompanied by an "empty head" sick feeling, which had occurred during the previous

night. She denied any loss of consciousness, changes in vision, headache or other neurological symptoms. On examination, she was conscious and oriented in person, time and space, with a normal neurological examination. Blood pressure was 142/82 mmHg, and heart rate was 89 beats per minute. The episode was interpreted as anxiety related. A head computed tomography (CT) scan and a 24-hour Holter monitor were requested, and anxiolytic medication (ethyl loflazepate 2mg) was prescribed as needed.

Later in September 2024, she returned to present the examination results, reporting persistence of symptoms previously described. The head CT scan revealed signs of ethmoid-sphenoidal sinusitis. Additionally, a nodular lesion was identified in the left parietal bone, measuring 13 mm in diameter. Multiple small lytic lesions were also noted, some with an expanding character, mainly in the left occipital bone (7 mm), as well as in the right occipital, parietal, and frontal bones. Further investigation of the abnormal test results was planned, which included blood analysis and a thoracic, abdominal, and pelvic CT scans.

In the following month, October 2024, at a subsequent programmed appointment, the patient returned to discuss the results from the requested complementary exams. The patient stated that her symptoms remained unchanged. She denied the presence of any constitutional symptoms. Breast and colorectal cancer screenings were up to date. Blood analysis at that time showed haemoglobin of 14.2 g/dL, creatinine of 0.68 mg/dL, urea of 36 mg/dL, lactate dehydrogenase (LDH) of 168 U/L, albumin of 4 g/dL, β2-microglobulin of 1.292 µg/mL, and normal serum protein electrophoresis. The thoracic CT scan reported asymmetry of the thyroid gland, with increased volume of the left lobe, where a hypodense nodule measuring 2.7 cm was observed, extending towards the superior and anterior mediastinum, with mild tracheal deviation to the right. Given the imaging findings, an urgent referral to Internal Medicine was made, and a thyroid ultrasound was requested.

Hospital Assessment

In November 2024, the patient was evaluated in an Internal Medicine appointment and was admitted to the ward for further investigation. From a symptomatic point of view, there were no significant changes.

During admission, blood analysis showed no relevant changes. Echocardiography revealed a left ventricular ejection fraction of 61% with no valvular dysfunction. Thoracic, abdominal, and pelvic CT scans were repeated in the hospital setting and showed no additional significant findings. Brain magnetic resonance imaging (MRI) demonstrated mild leukoencephalopathy and symmetrical loss of parenchymal volume. A positron emission tomography (PET) scan was performed, with the report pending at the time.

After 15 days of hospitalization, the patient was discharged with referral to a Thyroid Pathology appointment, to further evaluate the thyroid nodule. In February 2025, at the time of this appointment, a thyroid ultrasound was performed on site and revealed two significant nodules. In the right lobe, a hypoechoic nodule with microcalcifications measuring 9 × 7 × 9 mm was identified and classified as TI-RADS 5 (Thyroid Imaging Reporting and Data System). In the left lobe, a hypoechoic nodule with some cystic areas and substernal extension, measuring 27 × 29 × 19 mm, was classified as TI-RADS 4. The PET scan showed no evidence of abnormal radiopharmaceutical accumulation.

FNA was then requested, pending a formal thyroid ultrasound, previously requested by the family doctor. Further assessment from FNA results, raised suspicion of follicular Hürthle cell carcinoma, with a combined oncological risk estimated at 15–30%. A referral for General Surgery assessment was made, and a head single-photon emission computed tomography (SPECT) scan was suggested by Nuclear Medicine, to better characterize the cranial lesions.

At this time, the patient recalled having been advised to undergo fine-needle aspiration (FNA) 15 years ago, after the detection of a thyroid nodule, which had been postponed at the time due to pregnancy, and was never rescheduled. During that period, clinical records were hand-written and weren't posteriorly digitally transcribed to the EHR programs used either in the primary or secondary health care settings.

The patient was submitted to total thyroidectomy in november 2025, without any complications. Confirmatory results from the FNA continue on hold. The patient maintains a close surveillance with the family doctor. Due to a worsening of the depressive symptoms the antidepressive medication was adjusted. Clinically the patient maintains chronic fatigue, although resolution of the initial clinical picture.

Discussion

This case illustrates the multifactorial complexity of diagnostic processes in healthcare, particularly when longitudinal information is fragmented and poorly integrated across different levels of care. Although the patient maintained regular contact with her primary healthcare providers, critical clinical information was lost over time, resulting in delayed recognition of a potentially malignant thyroid condition and a prolonged, burdensome diagnostic pathway.

One of the central issues highlighted by this case is the fragmentation of medical records. Despite the widespread adoption of electronic health record (EHR) systems, interoperability between platforms remains limited in many healthcare systems. As a result, clinically relevant data—such as previous diagnostic features, exams results and reports, treatment plans or specialist opinions—may not be readily accessible to all healthcare professionals involved in a patient's care. In this case, the patient recalled that a recommendation for fine-needle aspiration (FNA) of a thyroid nodule was done 15 years ago, which was postponed and never rescheduled. The absence of this information from accessible medical records significantly delayed reassessment and definitive diagnosis.

The diagnostic cascade that followed the patient's non-specific symptoms illustrates how uncertainty can drive extensive investigation. Although each investigation was clinically defensible when considered in isolation, the cumulative effect was substantial, especially considering that some exams were doubled – since there is fragmented communication between the primary and secondary EHR. Over the course of the diagnostic process,

the patient underwent one head CT scan, two pelvic CT scans, two abdominal CT scans, two thoracic CT scans, one brain MRI, one PET scan, two thyroid ultrasounds, seven blood collections, one FNA, one echocardiogram, in addition to a 15-day hospital admission and numerous medical appointments. The estimated cumulative radiation exposure corresponds to approximately 15 years of background radiation [5]. Beyond the physical burden associated with the investigation, it is fundamental to also take into account the patient's psychological distress alongside this process and the impact caused on the family members. These effects reinforce the need for holistic, patient-centred care. This case represents the burden caused to the national healthcare system, due to repeated healthcare encounters, diagnostic exams, prolonged hospital admission and increased costs associated with all the above.

This case also raises important considerations regarding incidental findings and over-investigation. The identification of the initial multiple lytic skull lesions triggered further diagnostic escalation, despite the eventual absence of metabolically active disease on PET scan. On the other hand, thyroid nodules are common in the general population, particularly among women and risk increases with age. Yet only about 5 percent represents malignant disease. Timely risk stratification and early FNA, guided by ultrasound classification systems such as TI-RADS, are essential to avoid both underdiagnosis and over-investigation. In this patient, the deferral of an early FNA, combined with the absence of accessible clinical records, contributed directly to prolonged diagnostic uncertainty and late recognition of malignancy risk [6, 7].

With the widespread use of advanced imaging, the identification of incidental findings becomes more common, posing for new significant challenges amongst clinicians. Balancing the need to exclude serious pathology against the risks of overdiagnosis or overtreatment requires careful clinical judgement, multidisciplinary discussion, and particularly, clear communication with patients when it concerns the benefits and risks of every intervention.

Health literacy and doctor–patient communication emerges as another key factor, influencing the clinical trajectory. Although the patient had been informed about the need for thyroid investigation in the past, she did not fully appreciate its significance or the importance for follow-up. This underscores that information provision alone is insufficient; clinicians must ensure that patients understand, contextualize, and are able to act upon medical advice. Limited health literacy has been consistently associated with poorer outcomes, increased healthcare utilization, and reduced adherence to recommended care.

Family Medicine plays a critical role in mitigating many of the challenges demonstrated in this case. The core competencies of Family Medicine—continuity, coordination, and person-centred care—places the family physician as a central integrator of clinical information. Longitudinal follow-up enables family doctors to recognize patterns over time, revisit unresolved issues, and advocate for patients interests and needs while navigating the complexity of healthcare and healthcare systems. Furthermore, Family Medicine aims to promote shared decision-making and enhance patient health literacy, thereby decreasing the negative outcomes related to poor health literacy [8]. From a healthcare systems perspective, this case aligns with the principles of realistic medicine and value-based healthcare. Realistic medicine emphasizes personalized care, avoidance of harm, reduction of unnecessary interventions, and meaningful patient involvement in decision-making [9]. Earlier synthesis of available clinical information and improved communication between care levels could have reduced the diagnostic burden experienced by this patient, without compromising safety or quality of care.

Ultimately, this case demonstrates that a fine healthcare requires more than a functional informatic system. But instead, it depends fundamentally on integrated information systems, effective communication and interprofessional networks, sustained continuity of care, and empowered patients who are participative and supported in their own health journey.

Although we acknowledge the importance of this case, we also recognize its limitations. As this report describes a single clinical case, it does not allow for generalization of outcomes.

Conclusion

This case report demonstrates how the cumulative effects of fragmented medical records, delayed follow-up, and limited patient understanding can lead to significant diagnostic delay and unnecessary healthcare burden. The "worst end of misinformation" in this context was not the presence of false information, but rather the absence, loss, or poor transmission of clinically relevant information over time.

The patient underwent extensive investigation, multiple imaging studies, and prolonged hospital admission before suspicion of thyroid carcinoma was established. While modern diagnostic tools are invaluable, their indiscriminate or sequential use in the absence of integrated clinical reasoning may expose patients to avoidable harm, including excessive radiation, or psychological distress.

Strengthening the coordinating role of primary care, improving interoperability of EHR, and prioritizing health literacy are essential strategies to prevent similar scenarios. Family Medicine, through its longitudinal and person-centred approach, finds itself in a unique position to advocate patients' needs and values.

To summarize, in order to provide high-quality, safe, and sustainable healthcare, it is required not only technological advancement, but also promotion of effective communication, continuity of care, and empowerment of patients to proactively participate in their own health care.

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