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Chapter · December 2023

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# Incidental Lesions of the Brain with Potential Clinical Implications in Psychiatry

# 32

Sena Kısa Koç , Ayla Uzun Çiçek, and Yavuz Yılmaz

## 32.1 Introduction

Incidental lesions are findings that are seen during a medical investigation or imaging in clinical practice and are recognized without any suspicion or clinical symptoms. While the frequency of these lesions can be up to 34% in the general population, 10% of them have been determined to be clinically significant in studies [1]. With the increase in imaging frequency and accessibility, an increase in the incidence of incidental lesions has been observed recently. However, discussions on how to manage an incidental lesion, its clinical consequences and its risks in terms of medical ethics have increased [1]. At the same time, the necessity of obtaining informed consent from the patients or volunteers participating in the studies is discussed before the brain magnetic resonance imaging (MRI) and cranial tomography imaging, the results of which incidental lesions can be detected and produced are discussed. The stress that may occur in the time required to reach a radiologist or neurosurgeon after the detection of the lesions

is important from a psychiatric point of view [2]. Imaging to be performed during the advanced examination and follow-up process should also be examined in terms of health economy and workforce [3].

## 32.2 Prevalence of Incidental Findings

According to a meta-analysis involving a total of 16 studies and 19,559 individuals [4], 2.7% of MRI scans showed incidental abnormalities. While this rate was 4.3% in high-resolution brain MRIs, it was 1.7% in clinically typical low-resolution brain MRIs. This meta-analysis also shown that the likelihood of finding malignant lesions rises with age [4].

In a study conducted in Rotterdam with the participation of 5800 volunteers [5], incidental lesions were detected at a rate of 9.5% (in 549 volunteers). Meningiomas and cerebral aneurysms account for more than half of this rate. These are followed by abnormalities of the pituitary gland (1.2%), and then arachnoid cysts (1.6%) [5]. In these studies, the imaging frequency of lesions can be found to be low, since contrast material is not used in imaging techniques [4, 5].

Meike W. Vernooij conducted additional research on this topic in 2007 [6]. In this study involving 2000 participants, brain infarcts (145

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individuals) were the most prevalent incidental lesions, followed by cerebral aneurysms and benign primary tumors. Among the benign tumors, meningiomas were the most common [6].

In a study that included participants over the age of 65 [7], incidental lesions were found in MRI and computed tomography studies in 77.9% of the 503 participants, and only 22 individuals had worrisome lesions that required further investigation. 3.8% of them showed evidence of having neoplasm. Cysts were the most frequent type of these lesions [7].

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### 32.3 The Ethics of Managing Incidental Findings

The discovery of incidental lesions has been more common as the use of imaging in both research and clinical practice has expanded. Therefore, ethical issues have begun to surface in this area. The detection of lesions can be advantageous for patients or research participants, but it can also be detrimental in several aspects. For instance, early discovery of a life-threatening lesion can extend the patient's life expectancy, whereas the anxiety that may arise during the follow-up of rare lesions can be deleterious [8]. Because of this follow-up process, patients who require urgent clinical imaging may have to wait longer to access imaging facilities.

When a lesion is discovered, the time it takes to reach a specialist may be extended, or an advanced examination may be required [2]. In this case, the patient's anxiety should also be taken into account. The patient may apply to a second or third doctor in these circumstances. This anxiety is more noticeable in the parents of younger patients [9], so they may be more willing to get opinions from more than one expert [10], because of this, the country's health care system may face workforce and financial challenges. Therefore, J. Kole and A. Fiesler, in the article they published in 2013 [2], recommended that information be given about the risk of incidental lesion detection and obtaining the patient's consent before the imaging studies to be performed.

### 32.4 Informing a Patient About Incidental Lesions

In a study involving 32 volunteers [11], patients were asked how they wanted to be informed that they had an incidental lesion. It was questioned whether they received adequate support. Thirty-two volunteers with incidental brain lesions participated in the study and were informed before brain MRI study. This study indicated that the doctor's notification approach had a substantial impact on the patient. Some patients stated that the first notifying doctor did not want to give detailed information about the diagnosis in order not to take risks. As a result, they reported experiencing anxiousness for one and a half months prior to meeting with a neurosurgeon. They complained that the stress of the waiting period had caused their arterial blood pressure to rise. In addition, some patients reported that their physicians delivered the news in a stressful way. They claimed that this strategy led patients to conjure up terrifying tales regarding the lesion. In addition, 91% of patients felt it was more comfortable to get bad news face-to-face as opposed to over the phone. 9% of the patients indicated that receiving news over the phone was not an issue. 48% of the patients thought that learning early what the diagnosis of the detected lesion might be, what the treatment possibilities were and what kind of results it might cause would be better for their stress management. On the other hand, 52% of them stated that they thought it would be more stressful to learn what the diagnosis of the detected incidental lesion could be and what kind of results it might cause [11]. In another investigation on this topic, [12] patients with incidental lesions from the Rotterdam trial were interviewed. The purpose of these interviews was to determine why the patients participated in the study, if they desired to hear about lesions detected at the conclusion of the study. The majority of participants believed that learning about the lesion was advantageous, citing health precautions or treatment as the most important reason for this. When the patients learnt about the lesions, several of them initially believed that the lesions would not impact them.

Others thought that if clinically insignificant lesions were not highlighted, their lives would be less stressful and they would have a better quality of life overall. Specifically, they said that their relatives were under a significant lot of stress in this regard. Some participants were unprepared for this news and reported experiencing severe stress and headaches in the first few months. Patients who said they did not experience shock upon hearing the news in the short term also reported that these incidental lesions had less of an impact on their lives in the long term. However, they stated that they were slightly stressed during the follow-up days. Particularly when a lesion that can be treated is discovered, participants report being pleased that the lesion was detected and reported to them. Some patients believed it would be preferable not to learn about the lesion, and they made statements such as, “Whenever I have a headache, I believe it may be related to this issue,” and believed they had lost their independence. Volunteers stated that even if they were less affected, their families and relatives in their social environment experienced a great deal of stress as a result, and that they themselves endured very stressful periods, particularly for family members who had lost loved ones for similar reasons [12].

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### 32.5 Meningioma Patients’ Psychological Stress

In prevalence research on incidental lesions, benign tumors were determined to be the third most common cause [6]. Meningiomas were the most prevalent of these tumors. Asymptomatic meningiomas are identified in 1–2% of brain MRI examinations. With its slow growth and generally benign nature, it is observed more commonly and accidentally in the elderly, especially [13]. And it is more prevalent in females than males [14]. This frequency increases over time, especially with the increase in the frequency of imaging and the quality of the devices. After meningiomas are identified, they are often monitored or surgically removed. When both groups were compared to a healthy control group using

the Distress Thermometer (DT) and Hospital Anxiety and Depression Scale (HADS), rates of anxiety and depression were found to be elevated. According to HADS, anxiety disorder was identified in 45% of patients post-op and in 42% of patients who were followed up, while depression was identified in 61% and 87%, respectively. Additionally, sleep problems were detected in 45 and 42%, respectively. As a result, the stress factor in meningioma patients is lower than in patients with other aggressive central nervous system tumors, although anxiety is discovered at a rate of 80% and depression is recognized at a rate of more than 90%. Especially in patients who are followed up, the rate of depression is higher. For this reason, further studies are needed to increase psycho-oncological support in meningioma patients [15].

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### 32.6 Unruptured Aneurysms as Incidental Lesions

In the prevalence studies on incidental lesions, the second most common cause was found to be brain aneurysms. And the prevalence of unruptured aneurysms have grown as the number of recent check-ups have increased. Ruptured aneurysm has a significant mortality and morbidity rate (between 32 and 67% mortality at the period of bleeding). Anxiety may be caused by the possibility of aneurysm rupture in patients with incidentally identified aneurysms [16]. This anxiety may prompt the individual to seek treatment. There are two standard treatment modalities for unruptured aneurysms. These are endovascular coiling and surgical clipping method. It was determined that these treatments could cause negative outcomes including death in 8.8% and 17.8%, respectively. The treatment itself might present a greater danger to the participant’s physical and mental health than the abnormality itself does [17]. The frequency of unruptured aneurysms is between 0.6 and 4.2% [18]. Despite the low frequency of these aneurysms, they are important in terms of high risk of mortality and morbidity after rupture. In a study conducted in China [19], the quality of life of patients with

unruptured aneurysms was evaluated in terms of anxiety and depression. Detected incidental unruptured aneurysms in these patients were associated with high rates of depression, anxiety, and poor quality of life, especially when first detected. These have resulted in social isolation. After 5 years of observation, when these unruptured lesions are not treated, the anxiety and depression levels of the patients decrease and their quality of life improves, but when compared to the healthy control group, anxiety and depression remain high and social isolation is observed. In this study, it was observed that cognitive losses occur especially after 5 years of follow-up. Therefore, psychosocial support of patients and cognitive rehabilitation exercises are recommended after aneurysms are detected [19].

### 32.7 Stress in Newly Diagnosed Patients with Brain Tumors

It was determined that anxiety disorders resulting from brain tumors were more prevalent than other types. According to a study [20], sexual problems are one of the most prevalent issues in this regard, followed by fatigue and anxiety. In addition, it has been observed that anxiety is more prevalent in young people than in older people, and that this is reflected in the patients' functionality at the same rate. It is also known that suicidal ideation is more prevalent among oncology patients compared to the general population. In a study [21], 7.7% of patients with a brain tumor were diagnosed with severe depression, and 25.5% were diagnosed with moderate depression. It was determined that female patients are especially susceptible to this. Twenty-one percent of the patients (17 patients) reported having suicidal thoughts at least once during this process; two of these patients made a suicide plan, and this thought frequently crosses their minds. Even though patients with strong family support were identified in the study, rates of suicidal thinking and depression were discovered to be quite high. It has been observed that female patients, patients with a low level of education, and foreign nationals have a higher rate of depres-

sion and a greater risk of depression than others. In this study, frequent patient follow-up was recommended, particularly with regard to suicidal ideation [21].

### 32.8 Conclusion

The incidence of incidental lesion identification has increased as a result of the recent increase in imaging frequency, the technological advancement of imaging modalities, and the expansion of research on this topic. For this reason, additional research is required for the evaluation of the discovered lesions from an ethical, medical, and legal perspective. It has been suggested in some studies that the physician who initially evaluated the imaging should receive communication skills training prior to delivering the results to the patient [1].

**Conflict of Interest** There are no financial, personal, or professional interests related to this article.

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