**Thyroid**

**THYROID DISORDERS CASE REPORT**

**Sub-Acute Thyroiditis Presenting as Pyrexia of Unknown Origin**

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**Introduction:** Pyrexia of unknown origin (PUO) is often a diagnostic challenge. Common causes currently reported include non-infectious inflammatory disorders (NIID) (30.6%), infections (23.1%), malignancy (10.7%) and miscellaneous (12.4%). However, 23.1% remain undiagnosed despite extensive investigations. Fever is a component of subacute thyroiditis (SAT) in 28-83% of subjects reported in the literature. But its presentation as a PUO is reported only in a handful of subjects.

**Case Presentation:** A 71-year-old Asian male presented with evening fevers of 2-3 weeks duration. He had no accompanying sweats, cough, breathlessness, or weight loss. He had a past history of TB, polio, hydatid cyst and hypertension for which he was on treatment. He was a teetotaller. Several family members living in his native land had active TB and he visited them often. Clinical examination at initial presentation was unremarkable. He interrupted investigations to go back to Asia, and became unwell for over 6 weeks with evening fevers and sweating, a weight loss of over 7 kg, and a poor appetite. At this point he had no neck pain, palpitations or bowel abnormalities. Clinical examination continued to be normal upon his return to the UK and in the Endocrine Clinic.

**Investigations:** Investigations were done to exclude (a) infections - There was no growth of pathogenic organisms in repeated blood, urine and sputum cultures. Screening tests for TB, hepatitis, and glandular fever were negative. Blood screens for malarial parasites, amoebic and Brucella serology, and stools examination and culture were also negative. Echocardiography was normal. (b) Malignancy - Urine Bence Jones proteins and serum protein electrophoresis were normal. Bone marrow examination was suggestive of Leishmaniasis but a PCR test excluded this diagnosis. Humoral markers of malignancy were negative. CT scans of the thorax, abdomen and pelvis were normal and did not show any evidence of visceral abnormalities (c) NIID - CRP 120, ESR 130, with blood tests consistent with iron deficiency. Autoimmune screening for dsDNA, ANA, ANCA were negative. Upon return to the UK a PET/CT scan showed the diffuse tracer uptake in both thyroid lobes and changes consistent with a large left lobe. Free thyroxine was 28pmol/l (reference range 9-19.1), and TSH was undetectable (<0.004 mU/l). Thyrotrophin receptor antibodies were negative. Management and conclusion He was given carbimazole initially but this was stopped as he became severely hypothyroid. This hypothyroidism persisted for several months even after stopping carbimazole but reversed spontaneously. He therefore had a biphasic pattern of thyroiditis typical of SAT. There are only 9 previous cases reported of SAT presenting as PUO. Although SAT is a rare cause of PUO, early thyroid testing and if necessary, functional thyroid imaging should be considered in subjects with PUO to confirm it.

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**Subacute Thyroiditis After mRNA Vaccine for Covid-19**

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**Introduction:** Subacute thyroiditis is a well-documented clinical condition which typically presents 1-2 weeks after an acute viral illness. Presenting symptoms are classically those of thyrotoxicosis but with associated tenderness in the thyroid. Treatment of acute symptoms is possible and the thyroid function will generally normalize with time. Subacute thyroiditis has rarely been reported after administration of viral vaccinations such as the seasonal flu vaccine. We present a case of subacute thyroiditis which presented after administration of the mRNA COVID-19 vaccine.

**Case:** Patient is a 42yo female with no past medical history. She received the first dose of the Pfizer/BioNTech mRNA vaccine for COVID-19 on 12/22/20. Five days later, the patient complained of sore throat and palpitations. These symptoms progressed and she was evaluated in an urgent care on 12/31/20 where she was found to have tachycardia. Infectious work-up, including PCR for COVID-19, was negative and she was sent home. She took ibuprofen with some improvement of her symptoms. The following day she went to the ED; she was found to have a heart rate in the 130s with sinus tachycardia on EKG. Thyroid function testing was done which revealed TSH <0.01, ft4 4.58, ft3 11.8. Her TPO antibody was <28 and inflammatory markers were elevated including sed rate of 62. The patient was prescribed prednisone 40mg daily and propranolol 20mg as needed for symptoms. She reports rapid improvement of symptoms with prednisone. On 1/21/20, thyroid function showed TSH <0.01, ft4 down to 3.2, ft3 normal at 135. Thyroglobulin was elevated at 140.8 with negative thyroglobulin antibody, TRAb and TSI. Her inflammatory markers had decreased with sed rate of 26 and normal C-reactive protein. She had improved symptoms.

**Discussion:** Cases of subacute thyroiditis are most commonly associated with upper respiratory viruses but cases have been reported with traditional inactivated viral vaccines or live-attenuated vaccines such as those for annual influenza. We present the case of a 42-year-old female who has presented with a classic case of subacute thyroiditis which occurred in the time frame after receiving the Pfizer mRNA vaccine for COVID-19. Research has been ongoing for decades regarding development of mRNA vaccines but the mRNA vaccines for the SARS-CoV-2 virus have been the first to be widely distributed to the general population. Thyroiditis has not been reported as a common side effect but the cross recognition between the coronavirus spike protein targeted with the mRNA vaccine and healthy thyroid cell antigens exists as evidenced by this case.