A BITTER PILL TO SWALLOW: DOXYCYCLINE-INDUCED OESOPHAGITIS IN AN ELITE ATHLETE

FEATURE / DR CHRIS MOGEKWU

Introduction

Doxycycline is a widely prescribed tetracycline antibiotic with known gastrointestinal adverse effects, including pill-induced oesophagitis and oesophageal ulceration.[1] Pill-induced oesophagitis is an inflammatory injury of the oesophageal mucosa caused by prolonged contact of an orally administered medication with the oesophagus, often due to inadequate water intake or lying down soon after swallowing, leading to local irritation or ulceration.[2] Frequently implicated drug groups include Antibiotic, Bisphosphonates, Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), Iron Tablets and Potassium Chloride.[10] Such reactions have been reported even after a single dose.[3] A recent review suggested that athletes consume oral antibiotics, such as Doxycycline, nearly twice as often (2.7% vs 1.3%) as non-athlete populations reflecting higher healthcare consultation rates for respiratory symptoms and a tendency towards precautionary prescribing to minimise training disruption, even when bacterial infection is unconfirmed.[4] Although adverse reactions such as upper gastrointestinal injury are well documented in the general population, no published case reports have described doxycycline-induced oesophageal ulceration in elite athletes. This case report therefore highlights a rare but clinically important complication in a professional sporting context.

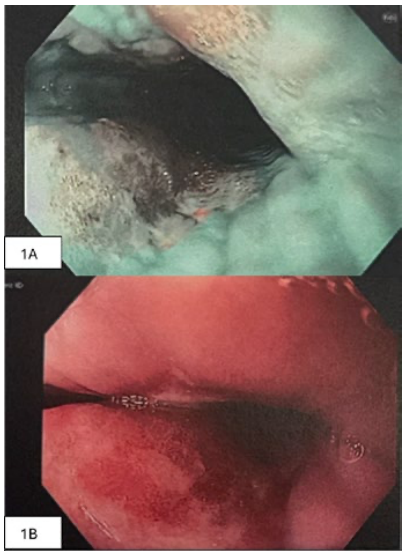

Figure 1a and 1b: *Showing endoscopic two opposing ("kissing") ulcers in the mid-oesophagus consistent with doxycycline induced oesophagitis.*

Case Study

A previously well elite-level athlete ("Athlete A") presented to the team physician on the morning of a competitive match with retrosternal pain that worsened after eating. The pain was colicky in nature and was also associated with an increased gag reflex with no signs of vomiting or nausea. Athlete A reported that a private doctor had recently prescribed them doxycycline 100 mg twice daily for a separate medical issue, which they had taken for two doses; the last immediately before going to bed the previous night. Athlete A's presumption at this point was that a pill "may be stuck in their throat". Initial management by the team physician included a presumptive diagnosis of gastro-oesophageal reflux disease (GORD) and treatment with esomeprazole 40 mg stat (and to reduce to 20mg OD for a duration of 4 weeks from the following day), along with Gaviscon® and Pepto-Bismol® if required. They were withdrawn on medical grounds from being selected for the upcoming fixture and Athlete A was advised to adopt a soft diet, avoid spicy foods, and discontinue doxycycline.

Despite this, the pain persisted, and later that day they attended an urgent care centre with the team physician. Blood tests, including troponin and D-dimer, were normal, and electrocardiography demonstrated sinus rhythm with no evidence of ischaemia. Athlete A declined chest radiography and was discharged with safety-net advice with gastritis being the likely cause of his symptoms.

Over the subsequent 72 hours, Athlete A's symptoms remained unresolved, and they were referred to a consultant gastroenterologist. Upper gastrointestinal endoscopy (OGD) revealed two opposing ("kissing") superficial ulcers in the mid-oesophagus, consistent with pill-induced oesophagitis due to doxycycline (see Figure 1). Their proton pump inhibitor dose was increased to 40mg twice daily, and sucralfate suspension 2g twice daily was commenced. Both treatments were continued until repeat OGD at six weeks. The athlete's symptoms improved, allowing return to training after a total of 10 days from the initial presentation. Follow-up endoscopy demonstrated a complete resolution of the oesophageal ulcer (see Figure 2) and Athlete A was advised to avoid future doxycycline use and use NSAIDs (Non-Steroidal Anti-Inflammatory Drugs) with caution.

Discussion

This case highlights a rare but clinically significant complication of doxycycline use in an elite athlete: pill-induced oesophageal ulceration. While oesophageal injury from doxycycline is well described in the general population,[1,2] to our knowledge this is the first report in a professional sporting context. Recognition of this condition is particularly important in athletes, whose medication use patterns, and physiological stressors may heighten their vulnerability.

Athletes, despite being younger and generally healthier than the general population, use physician prescribed

Figure 2: *Showing follow-up endoscopy demonstrating complete resolution of the oesophageal ulcers after proton pump inhibitor and sucralfate therapy.*

medications, including antibiotics, at equal or higher rates than non-athletes, with elite athletes showing a particularly high usage. Furthermore, NSAIDs are widely used in both elite and recreational sport, often at high frequency or even prophylactically.[5,6] In some cohorts of competitive athletes, regular NSAID use exceeds 50%.[7] NSAIDs are independently associated with gastrointestinal mucosal injury through prostaglandin inhibition and impaired mucosal defence. Concomitant use with antibiotics such as doxycycline may therefore synergistically increase the likelihood of oesophagitis and ulceration. In this case, the recent initiation of doxycycline may have compounded mucosal vulnerability and contributed to symptom severity in an athlete who had been known to take NSAIDs in the past.

The clinical presentation of pill-induced oesophagitis is often acute retrosternal pain, sometimes accompanied by odynophagia or dysphagia. Endoscopic findings typically demonstrate well-demarcated, superficial "kissing" ulcers in the mid-oesophagus, as observed in this athlete. Management involves discontinuation of the offending drug, initiation or escalation of proton pump inhibitor therapy, and mucosal protectants such as sucralfate. Prognosis is generally favourable, with symptom resolution expected within days to weeks if treatment is prompt. To further avoid adverse effects, doxycycline is best taken with plenty of water, and one should remain upright for 30 minutes post ingestion.[8]

An additional learning point from this case is the importance of athletes fully disclosing all medications and

supplements they are taking. Failure to disclose increases the risk of drug–drug interactions, duplicated prescribing, and preventable adverse effects, as illustrated here. Moreover, non-disclosure carries regulatory consequences. Under World Anti-Doping Agency (WADA) regulations, certain prescribed medications and over-the-counter preparations may be prohibited or require a therapeutic use exemption (TUE).[9] Inadequate reporting of medication use therefore not only jeopardises player safety but can also expose athletes and teams to anti-doping violations, with significant sporting and reputational consequences. Routine communication and structured medication reviews within elite sport are essential to mitigate both medical and regulatory risks. This is something that we do at certain points during the season but would now consider doing more regularly to ensure we identify any athletes at risk of adverse drug effects or being at risk of inadvertently committing an anti-doping violation.

For clinicians in sports medicine, this case underscores the importance of careful prescribing in athletes who are already prone to high antibiotic and NSAID exposure. Preventative education – such as ensuring doxycycline is taken with sufficient water and avoiding recumbency immediately afterwards – is crucial to reduce risk. Awareness of this complication may also prevent unnecessary cardiopulmonary investigations when athletes present with acute chest or abdominal pain.

Key Take-home Messages

1. Doxycycline can cause pill-induced oesophagitis and ulceration, even after a short course, and clinicians should be alert to this when athletes present with acute retrosternal pain.
2. Athletes are at higher risk of antibiotic use due to infection susceptibility and pressure for rapid recovery, and they frequently combine antibiotics with NSAIDs, further increasing the risk of gastrointestinal injury.
3. Full disclosure of all medications and supplements by athletes is essential to prevent adverse drug interactions and to ensure compliance with WADA regulations regarding prohibited substances and TUEs. This process should be supported by structures medication and supplements reviews conducted with a qualified clinician at key points throughout the competitive season (e.g. pre-season, mid-season, and prior to major competitions), allowing for proactive risk assessment, regulatory compliance, and athlete safety.

References

1. Holland A, Harrison A, Whitford M, Watson M, Shrestha S, Shah R, et al. Doxycycline-induced pill oesophagitis: a case report and review of literature. Clin Med Insights Case Rep. 2024;17:11795476241239643. doi:10.1177/11795476241239643.

2. Abraham SC, Cruz-Correa M, Lee LA, Yardley JH, Wu TT. Pill-induced esophagitis: a clinicopathologic study of 78 cases. American Journal of Surgical Pathology. 2001;25(6):867–872.

3. Almayoof A, Alhabboubi F, Alhabboubi A, Alhabboubi S. Doxycycline-induced oesophageal ulcer after a single dose: a case report. Cureus. 2024;16(7):e65321. doi:10.7759/cureus.65321.

4. Fayock K, Voltz M, Sandella B, Close J, Lunser M, Okon J. Antibiotic Precautions in Athletes. Sports Health. 2014 Jul;6(4):321–325. doi: 10.1177/1941738113506553

5. Alaranta A, Alarenta H, Helenius I. Use of Prescription drugs in Athletes. Sports Med. 2008;38:449-463

6. Alaranta A, Alarenta H, Heliövaara M, Airaksinen M, Helenius I. Ample use of Physician-Prescribed Medications in Finnish Elite Athletes. Int J Sports Med. 2006;27:919-925

7. Wolfarth B, Roecker K, Berger J, Dickhuth HH, Kindermann W, Pfeiffer M, et al. Analgesic use in sports: results of a systematic literature review. Sports Med Open. 2023;9(1):14. doi:10.1186/s40798-023-00585-2.

8. Carlborg B, Densert O, Lindqvist C. Oesophageal lesions caused by doxycycline capsules. BMJ. 1983;286(6373):1172–1173.

9. World Anti-Doping Agency. The 2025 Prohibited List: International Standard. Montreal: WADA; 2024. Available from: https://www.wada-ama.org/sites/default/files/2024-09/2025list_en_final_clean_12_september_2024.pdf