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# Cutaneous infection with *Mycobacterium fortuitum* after subcutaneous injection of human chorionic gonadotropin

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## Abstract

**Background:** Weight loss clinics are common in the United States. Unfortunately, some offer dubious weight loss methods such as self-administered human chorionic gonadotropin (HCG) injections. HCG products are unregulated, yet, widely available. Infection is among the risks potentially associated with this treatment. We report a case of skin infection caused by *Mycobacterium fortuitum* after HCG injection.

**Case Presentation:** A 51-year-old woman with a history of hypogammaglobulinemia presented with an eight week history of a tender abdominal lesion. The lesion was at the site of a previous HCG injection. Acid-fast bacilli (AFB) culture grew *Mycobacterium fortuitum*. Based on the organism's susceptibility profile, sulfamethoxazole-trimethoprim 800-160 mg and ciprofloxacin 500 mg were both prescribed. The case was referred to the Missouri Department of Health. Based on clinical progress treatment was continued for a total of six months.

**Conclusions:** This case illustrates the potential for cutaneous infection by *Mycobacterium fortuitum* and other rapidly growing mycobacteria after HCG injections. Clinicians should maintain a high index for suspicion for rapidly growing mycobacteria when evaluating persistent skin lesions at sites of trauma or skin puncture.

**Keywords:** *Mycobacterium* infections, nontuberculosis, skin diseases, infectious, human chorionic gonadotropin, drug effects, *Mycobacterium fortuitum*

## Introduction

Human chorionic gonadotropin (HCG) was first proposed as an adjunctive agent for weight loss in the 1950s [1]. Despite its questionable efficacy, HCG continues to be prescribed in medical spas and obesity clinics that are not regulated by the Food and Drug Administration [2-5].

*Mycobacterium fortuitum* infection typically results in pulmonary disease or cutaneous disease associated with trauma or surgical procedures [18]. Infection has been reported in many cosmetic procedures [8-15]. To our knowledge no reports of infection secondary to HCG injection as a weight loss supplement have been reported to date. We report an infection at a HCG injection site with *Mycobacteria fortuitum*.

## Case Synopsis

A 51-year-old woman with a history of hypogammaglobulinemia presented to a dermatology clinic with an eight-week history of a tender left abdominal lesion. The patient had received pre-filled HCG syringes for weight loss from a private medical spa for self-injection. The lesion appeared one and a half weeks after her last injection at an injection site. Physical exam revealed a 4 x 2 cm erythematous, minimally raised plaque with overlying erosion on her left abdomen (**Figure 1**). A shave biopsy was performed and sent for bacterial, acid-fast, and fungal cultures. Azithromycin (500 mg on day 1, and 250 mg on days 2-5) and mupirocin ointment were prescribed.

The biopsy specimen showed a neutrophilic infiltrate with signs of granulation and organization. No



**Figure 1.** Skin lesions due to infection with *Mycobacterium fortuitum* before 6 months of therapy with sulfamethoxazole-trimethoprim and ciprofloxacin.

microorganisms were identified by Gram, Fite, or GMS stains. The fungal and routine bacterial cultures were negative.

Eighty-two days after symptom onset, the patient reported minor improvement from the azithromycin and was prescribed an additional 10 days. AFB culture had grown *Mycobacterium fortuitum* susceptible to amikacin, ciprofloxacin, moxifloxacin, linezolid, and trimethoprim/sulfamethoxazole.

The patient was referred to the infectious disease department and was seen 95 days after symptom onset. She reported the area was smaller and less tender, although drainage was present. Examination of the lesion revealed a 2.5 x 1 cm tender, indurated, erythematous plaque with purulent drainage. Based on the organism's susceptibility profile, sulfamethoxazole-trimethoprim 800-160 mg and ciprofloxacin 500 mg were both prescribed twice daily. The tentative plan was for four months of therapy.

The patient returned for follow up in infectious disease clinic 124 days after symptom onset. She noted continued improvement. The patient brought an unused and unopened syringe from the private medical spa, which was submitted for mycobacterial culture. The culture was negative after six weeks. The case was referred to the Missouri Department of Health, and antibiotics were continued.

The patient noted progressive improvement 210 days after symptom onset after completing the four-month antibiotic regimen. The plaque was no longer painful. Minor induration remained at the sight of the lesion, which appeared to be consistent with scar, although potential residual infection could not be ruled out (**Figure 2**). For this reason, the antibiotic regimen was continued for two additional months.



**Figure 2.** Skin lesions due to infection with *Mycobacterium fortuitum* after 6 months of therapy with sulfamethoxazole-trimethoprim and ciprofloxacin.

## Case Discussion

Weight-loss is the most common therapeutic use of HCG. The original Lancet article on HCG and diet was published in 1954, claiming that HCG was an effective diet supplement that promoted fat mobilization and weight loss [1]. Five years later, Sohar et al. contradicted these findings, believing the sole reason for weight loss was the hypocaloric diet [16]. In 2009, the American Society of Bariatric Physicians reviewed the data on the Simeons method and concluded they did not recommend the Simeons method for weight loss, the Simeons diet, or the use of HCG for weight loss [17].

Although lack of efficacy alone is reason enough to avoid HCG use for weight loss, toxicity is another. One study reports deep venous and pulmonary embolism related to HCG injection. The current report is the first to raise infection as a concern [5]. This may be of more widespread clinical significance for immunosuppressed patients because HCG preparations used for weight loss vary widely in

content and purity, are not regulated by the FDA, and are self-administered by patients [2].

Rapidly growing mycobacteria (RGM) produce visible colonies on culture in < 7 days, which differentiates them from other nontuberculous mycobacteria. The most common species of RGM in the USA and Europe are *Mycobacterium abscessus*, *Mycobacterium fortuitum*, and *Mycobacterium chelonae* [22]. Procedures reported to cause infection include acupuncture, liposuction, silicone injection, breast implantation, intravenous catheter use, insulin injections, dermatologic surgery, pedicures, pacemaker placement, subcutaneous injections, and intramuscular injections [23-40]. In addition to preceding trauma, immunosuppression is a risk factor for RGM skin infections [41]. Primary cutaneous infections caused by RGM are often localized to the injured site and may manifest as painful nodules, abscesses, or ulcers [42-43].

In our patient with immune compromise, infection may have been acquired from the presence of mycobacteria on the patient's skin or mycobacterial contamination of the HCG preparation. Multiple possible lapses in infection control may have led to contamination. The preparation may not have been prepared under sterile conditions or contaminated after initial preparation in storage, in filling of syringes, or in subsequent storage of syringes. We are hopeful the public health investigation will help to answer this question.

RGM infections have no pathognomonic clinical picture and the histologic findings vary; therefore, biopsy for culture in addition to histology is recommended [45]. However, development of a sub-acute cutaneous lesion after a subcutaneous injection should rouse suspicion for RGM infection. Optimal treatment of rapidly growing mycobacterial infections remains poorly established. Current guidelines recommend susceptibility testing of all isolates, with use of empirical therapy suggested until susceptibilities are known [45-46]. In addition to medical therapy, surgical debridement may be useful in some cases.

## Conclusion

In conclusion, we report a case of *Mycobacterium*

*fortuitum* infection after HCG injections. This case adds to the body of literature reporting iatrogenic RGM infections resulting from inadequately regulated procedures. As the incidence of immunosuppression and skin-related medical procedures continues to rise, clinicians would be well advised to have a high index of suspicion for RGM infection when evaluating persistent skin lesions at sites of trauma or skin puncture.

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