

CHRONIC SKIN LESIONS, ERECTILE DYSFUNCTION AND LONG-TERM MOBILE PHONE EXPOSURE: A CASE REPORT HIGHLIGHTING AGE-RELATED VULNERABILITY

Tjing Yung Loo, Mary NB Cheung*

Dental Clinic & Essence Medical Laboratory.

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*Corresponding Author: Dr. Mary Cheung

Dental Clinic & Essence Medical Laboratory.

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ABSTRACT

1. Introduction: Mobile phone use has become ubiquitous globally, with chronic electromagnetic field (EMF) exposure emerging as a potential environmental health concern. The International Agency for Research on Cancer (IARC) has classified radiofrequency electromagnetic fields as possibly carcinogenic to humans (Group 2B) in its monographs, highlighting the need for further research on their health impacts.^[18] Older adults may exhibit increased vulnerability to EMF-related physiological effects due to age-related declines in skin barrier function, immune regulation, and vascular health.^[16] Age-related skin changes, such as reduced stratum corneum hydration and impaired barrier function, further enhance this susceptibility.^[4] This self-reported case describes a 65-year-old male with chronic skin lesions linked to localized mobile phone exposure, alongside erectile dysfunction (ED) of unknown etiology, highlighting a potential association between long-term EMF exposure and age-related multi-system health impacts—consistent with growing evidence linking EMF exposure to various physiological disruptions.^[9,10] Purpose: To raise public health awareness of potential health risks associated with prolonged mobile phone electromagnetic field (EMF) exposure, particularly in older adults.

KEYWORDS: Mobile phone radiation, Electromagnetic fields, Skin lesions, Erectile dysfunction.

2. Case Presentation

2.1 Demographics and Medical History

A 65-year-old male with no prior history of chronic dermatological conditions, hypertension, diabetes mellitus, or cardiovascular disease presented with chronic skin lesions and ED. He reported daily mobile phone use for 8–10 hours over the past 10 years, with a habitual practice of carrying the mobile phone in his right trouser pocket. Previous studies have noted that prolonged mobile phone use (≥ 4 hours/day) is associated with increased risk of subjective symptoms related to EMF exposure.^[6,7]

2.2 Timeline of Skin Lesions

November 2025: The patient first developed pruritic erythematous rashes involving the lower abdomen (below the umbilicus), perineal region, and bilateral thighs. The rash was initially attributed to environmental dryness, with no identified triggers at the time.

December 2025: The rash on the lower abdomen and perineum gradually resolved over approximately one month with no specific treatment.

April 2026: Reappearance of erythema and pruritus localized to the right thigh (the area corresponding to the right trouser pocket where the mobile phone is carried). Key observations included:

- Provocation by mobile phone heat/EMF: The lesion exacerbated after daytime mobile phone placement in the pocket, with the phone emitting noticeable heat that directly stimulated the erythematous area. Previous research has shown that mobile phone radiation can alter protein expression in human skin, potentially contributing to inflammatory responses.^[3]
- Diurnal fluctuation: No symptoms at night (when the mobile phone was not carried in the pocket); desquamation occurred in the morning, followed by recurrence of erythema and papules during daytime

mobile phone exposure. This pattern aligns with findings that EMF exposure can activate matrix metalloproteinases in keratinocytes, leading to skin barrier disruption and inflammation.^[2]

2.3 Erectile Dysfunction

The patient reported the onset of ED approximately 2 years prior, with gradual worsening over time. No organic causes (e.g., hormonal imbalances, vascular disease) were identified via routine clinical evaluations. He noted a temporal correlation between the escalation of ED symptoms and increased mobile phone use (including carrying the device in the front trouser pocket near the pelvic region). Emerging evidence suggests that non-thermal effects of radiofrequency EMF can impair male reproductive function by disrupting vascular and neuronal pathways critical for erectile function,^[9] and

long-term exposure may reduce serum testosterone levels—a key hormone for sexual function.^[14]

3. Clinical Findings

3.1 Skin Examination

Right thigh: A well-circumscribed erythematous patch with scattered papules and superficial desquamation was observed (as shown in clinical images). The lesion was tender to palpation and pruritic, with no signs of secondary infection (e.g., pustules, exudate). Oxidative stress, which is heightened in aging skin,^[4] may have exacerbated the EMF-induced skin irritation observed in this patient.

Other regions: Residual hyperpigmentation was noted on the lower abdomen and perineum, consistent with resolved erythematous rashes.



Figure A



Figure B

Figure A. B. These clinical photographs capture the localized skin lesion on the patient's right thigh, corresponding to the area where he habitually carried his mobile phone in the right trouser pocket. The images show a well-circumscribed erythematous patch measuring approximately 6 cm × 4 cm, distributed over the anterolateral aspect of the right thigh. Scattered small papules (2–3 mm in diameter) are visible within the erythematous area, accompanied by superficial, fine desquamation that appears as white, flaky scales overlaying the redness. The lesion boundary is distinct, with the erythema gradually fading at the edges without extending to the surrounding normal skin. There are no signs of secondary infection, such as pustules, exudate, or crusting. The skin surface appears slightly dry but intact, consistent with the patient's reported pruritus and diurnal fluctuation of symptoms tied to mobile phone exposure. These images directly illustrate the localized inflammatory response associated with chronic

EMF/heat exposure from prolonged mobile phone placement.

3.2 Auxiliary Examinations

Skin prick tests for common allergens (e.g., dust mites, pollen) were negative, ruling out allergic contact dermatitis—consistent with systematic reviews indicating that EMF-related skin symptoms are distinct from allergic dermatitis.^[5]

Routine blood tests (complete blood count, liver/kidney function, glucose, lipid profile) and hormonal assays (testosterone, luteinizing hormone) were within normal ranges. This aligns with studies showing that EMF-induced reproductive effects may occur independently of systemic hormonal imbalances.^[15]

4. DISCUSSION

This case suggests a potential causal link between localized chronic mobile phone EMF/heat exposure and

the development of chronic skin lesions in an older adult. The key supporting evidence includes: (1) the spatial correlation between the lesion site and mobile phone placement; (2) the diurnal fluctuation of symptoms tied to mobile phone use; (3) the exclusion of other common etiologies (e.g., allergy, systemic disease). A nationwide cohort study in Denmark previously examined the association between mobile phone use and skin cancer, highlighting the need to consider EMF exposure as a potential risk factor for skin lesions.^[8]

Age-related skin changes (e.g., reduced stratum corneum hydration, impaired barrier function) likely increased the patient's susceptibility to EMF/heat-induced irritation.^[4] Additionally, EMF exposure may disrupt cutaneous microcirculation and immune cell function, leading to persistent inflammation and desquamation—consistent with *in vitro* studies showing that radiofrequency EMF can activate pathways involved in skin inflammation.^[2] Karinen et al. also reported that mobile phone radiation can alter protein expression in human skin, further supporting a mechanistic link between EMF exposure and skin pathology.^[3]

The co-occurrence of ED raises further questions about the systemic effects of chronic EMF exposure. Pelvic EMF exposure (from front trouser pocket carry) may interfere with penile vascular endothelial function or neuronal signaling—pathways critical for erectile function—particularly in older adults with age-related vascular decline. Desai et al. reviewed the pathophysiology of mobile phone radiation, noting that oxidative stress induced by EMF exposure can impair male reproductive function, including erectile function.^[10] Kesari and Behari demonstrated that mobile phone radiation induces oxidative stress and affects sperm quality in rats, suggesting broader impacts on the male reproductive system.^[11] A systematic review and meta-analysis also found an association between mobile phone use and reduced sperm quality, which may be linked to similar vascular or neuronal disruptions as those proposed for ED.^[12] Chen et al. further confirmed an association between electronic device usage and sperm quality parameters in healthy men, supporting the potential reproductive impacts of EMF exposure.^[13]

While definitive causation cannot be established from a single case, this observation warrants further epidemiological and experimental research into EMF's impact on reproductive and vascular health in aging populations. The National Toxicology Program's 2018 report on radiofrequency radiation exposure in mice highlighted potential systemic health risks, underscoring the need for additional research in humans.^[16] Hardell et al. also noted an association between mobile phone use and glioma risk, suggesting that EMF exposure may have wide-ranging systemic effects beyond skin and reproductive health.^[17]

5. CONCLUSION AND PUBLIC HEALTH RECOMMENDATIONS

This case highlights the potential health risks of unregulated mobile phone use, especially in older adults, who may be more vulnerable to EMF/heat-induced adverse effects. The World Health Organization (WHO) has recognized mobile phone EMF as a public health concern, emphasizing the need for evidence-based guidelines to reduce exposure.^[19] Key public health recommendations include:

- Reducing localized exposure: Avoid carrying mobile phones in trouser pockets for prolonged periods; use hands-free accessories or a bag instead. This recommendation aligns with findings that localized EMF exposure is associated with site-specific symptoms.^[6,7]
- Limiting daily use: Minimize cumulative mobile phone use time, particularly for older adults with pre-existing skin or vascular conditions. Previous studies have linked prolonged use to increased subjective symptoms and physiological disruptions.^[6,9]
- Increased surveillance: Healthcare providers should consider EMF exposure as a potential risk factor when evaluating chronic skin lesions or ED in older patients with heavy mobile phone use. Systematic reviews have highlighted the need for clinicians to recognize EMF-related skin effects.^[5]

Further large-scale studies are needed to elucidate the dose-response relationship between mobile phone EMF exposure and age-related health outcomes, and to develop evidence-based guidelines for safe mobile phone use in vulnerable populations. Recent research on millimeter-wave therapy and its biophysical mechanisms also underscores the need to better understand how EMF interacts with human tissue, particularly in aging populations.^[20]

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