



# CONFLUENT AND RETICULATED PAPILOMATOSIS (CARP)

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Confluent and reticulated papillomatosis (CARP), also called confluent and reticulated papillomatosis of Gougerot and Carteaud, is an uncommon skin condition that consists of multiple small, hyperkeratotic macules or papules that coalesce to form patches or plaques with a reticulated (net-like) pattern peripherally. It may present with a velvety or scaly appearance. Rarely, it can present with atrophic macules with a cigarette-paper-like appearance. It commonly originates in the chest or upper mid back. Less commonly it can affect the face, flexural areas, and groin. CARP is benign and usually asymptomatic, but may cause some mild itching.

Given the close similarity in morphology and anatomical distribution, CARP is commonly misdiagnosed as **tinea versicolor**. In clinical practice, differentiating CARP from tinea versicolor can be accomplished by an absence of fungal elements on potassium hydroxide (KOH) preparation. Additionally, there should be a high suspicion of CARP if tinea versicolor is tentatively diagnosed and does not respond to appropriate antifungal therapies. CARP is occasionally confused for **acanthosis nigricans** given the sometimes velvety texture of CARP, but the typical locations for acanthosis nigricans (posterior neck, intertriginous folds and flexural areas) and usual endocrine comorbidities (diabetes mellitus, obesity, or PCOS) are usually absent. A skin biopsy of CARP is characterized by hyperkeratosis, papillomatosis, focal acanthosis, increased melanin pigmentation, and increased melanosomes, but unfortunately no histologic features are pathognomonic so must be interpreted with clinical context.

The cause of CARP remains unclear and controversial, but multiple theories and associations have been proposed. One of the more popular theories suggests CARP is secondary to a hyperproliferative state of keratinocytes secondary to an unknown stimulus, an inherited mutation in keratin 16 or an unknown heritable factor, or less likely in response to ultraviolet radiation. Another theory is that CARP is in response to an underlying endocrine problem and that patients often have concomitant diabetes mellitus or obesity. Other proposed mechanisms include an inflammatory response to *Malassezia* fungi, *Dietzia* papillomatosis bacterium, or a localized deposition of amyloid.

CARP most often arises in pubertal age young adults with a slight male predilection. Mean age of onset is 15 years old, with most cases being diagnosed in 8-32 year olds. Cases have also been less commonly described in younger pediatric and geriatric populations. CARP is found worldwide and in all skin colors and ethnicities.

Similar looking conditions include:

- **Tinea versicolor**
- **Acanthosis nigricans**
- **Seborrheic dermatitis**
- Macular or lichen amyloidosis
- **Erythema dyschromicum perstans**
- **Erythrasma**
- **Vitiligo**
- Terra firma-forme dermatosis
- **Erythema ab igne**

First-line treatment for CARP is **minocycline** 50-100 mg twice a day for 6 weeks, but more extended therapy may be warranted in some cases. For patients unresponsive to minocycline or if minocycline therapy is contraindicated, second-line therapy is macrolide class antibiotics. Third-line therapeutic options include **tetracycline**, **doxycycline** or cefdinir antibiotic therapy.

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Alternative therapies include **topical retinoids**, **calcipotriene**, topical **tacrolimus**, **isotretinoin**, and **acitretin**. Isotretinoin and acitretin are reserved for severe and refractory cases and should be used with extreme caution in females of childbearing age. CARP can be difficult to treat and can recur after treatment discontinuation. Occasionally, there is spontaneous resolution that occurs over the course of several months to several years.

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