Colonoscopy and colonography: back to the roots

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Abstract. – “Colonoscopy” and “colonography” refer to the endoscopic and radiological examination of the colon respectively. Medical terminology constructs words using original roots from the source languages, which are often Greek or Latin. The word root is the fundamental portion of the term. Multiplication of modern tests and procedures has led to confusion in the application of word roots in medical terminology. This short review (1) analyzes, (2) challenges the established terms “colonoscopy” and “colonography”, and (3) proposes a wording adherent to the rules of terminology in order to avoid confusion.

Key Words:
Colonoscopy, Coloscopy, Colonography, Colography, Terminology.

Medical terminology devises terms which describe the human body and all diseases, conditions, procedures and any other processes related to it. Word construction in medical terminology is based on a systematic approach which uses the concepts of etymology, word roots, prefixes and suffixes.

The word root is the fundamental part of word building. This word root is derived from a source language, most often Greek and Latin, which are the mother languages of the western civilization. Using the word root as the foundation, combinations or additions can be used to create new terms, conveying the appropriate meaning. A logical process disciplined to language rules applies to creating medical terminology. The term created needs also to be suitable to a modern language, e.g. English, especially in the way of pronunciation or phonetics.

The word gastroenterology is an example of word composition. This word consists of three Greek components: η γαστηρ (gaster, stomach), το έντερον (enteron, gut), and ο λόγος (logos, study), seamlessly combined to convey the meaning of the “study of the stomach and the gut”.

Similarly, cardiology (καρδιολογία) refers to the study of the heart (η καρδια: cardia, heart; ο λόγος: logos, study).

Medical terminology has respected and maintained over the centuries the rules of the source language. However, as new procedures or tests continue to rapidly develop, some violations have taken place. For example, colonoscopy is the popular term used to describe the endoscopic examination of the colon¹-³. This is also occasionally referred to as coloscopy⁴. The radiological study of the colon that non-invasively screens for colorectal cancer is referred to both as colography⁶,⁷ and colonography⁸-¹⁰. As some of these terms are constructed violating rules of linguistics, we feel the rules for formulating the terminology should be clarified and that the correct version of each term should be established.

The compound word colonoscopy consists of the Greek words το κόλον (colon, also known as το έντερον: enteron), and σκοπία (scopia, or σκόπησις, scopesis). The second word scopia is used correctly but it derives from the verb σκοπέω (scopeo, hence scope) which literally means to observe or examine with the eye or the mind.

The word colon in its original form is κόλον and simply means the gut. Another potentially
confusing word exists in Greek: κολωνός (colonus), which translates to a hill. In the word κόλον, that pertains to the gut, κόλ- (col-) is the root of the word and “-ον” (“-on”) is the disposable ending. For the purpose of word construction, the decisive factor in all cases is the last letter of the root, i.e. in this case the “λ” in κόλ- (“l” in col). This last letter is called the character. If the character of the root is a consonant (e.g. lambda) and the next word to be added to the root also begins with a consonant (e.g. “ο” or sigma, whose English equivalent is the letter “s”), the Greek grammar rules dictate that a vowel needs to be introduced between the two words. A vowel is added in order to achieve a fluent, musical sound, since the pronunciation of sequential consonants in the Greek language is regarded as cumbersome and awkward-sounding, as it might be in English too.

Based on the above rules of Greek grammar, combining the root κόλ- (col-) with σκοπία (scopia) would theoretically give rise to κολωνόσκοπία (coloscopy). The “λσ” (“ls”) sound is phonetically cumbersome and therefore the vowel “ο” is added to the root to create κολ-οσκοπία (col-oscopy, i.e. coloscopy). A single “ο” sound is enough to create a meaningful, compound word. The introduction of the sound “ονο” (“ono” in English) to create κολ-ονοσκοπία (col-onoscopy) is superfluous and meaningless, both grammatically as well as semantically (literally meaning “examination of the hill”).

In the terms colonography and colography, the word -γραφία (graphia, graphic visualization) derives from the verb γράφω. In combination with κόλ-ον (col-on, meaning the gut), the compound term is colography, and with the addition of a phonetic “ο” to eliminate the difficult sound “λγ” or “lg”, this becomes col-o-graphy. To create the term colonography, the root of the word colon-os (meaning hill) would have to be employed, rendering the combination meaningless and incorrect.

By application of exactly the same principles based on the word root, we use in medical terminology the correct compound terms pharmac-o-logy (not pharmacon-o-logy) and neur-o-logy (not neuron-o-logy). Similarly, the correct compound terms col-o-stomy (not colon-o-stomy), col-o-vesical fistula (not colon-o-vesical), sig-moid-o-scropy (not sigmoidon-o-scropy), enter-o-graphy (not enteron-o-graphy) are frequently heard among gastroenterologists. The correct term col-ectomy (not colon-ectomy) also deserves special mention. In the case of cectomy, it must be noted that a phonetic “ο” may not be added to the root col-. This is because the second word εκτομή (ectomy; meaning surgical excision) begins with the Greek vowel “ε” or “epsilon” (“e” or “E” in English) instead of a consonant. Coectomy is therefore phonetically fluent, as is col-itis rather than colon-itis to refer to inflammation of the colon.

In summary, we believe the correct terms for colonoscopy and colography are coloscopy and colonography. We recognize that old habits die hard, and colonoscopy has already become the established and popular term to describe the endoscopic examination of the gut. However, with the blossoming of new diagnostic technology and imaging, this is perhaps the right point in time for the medical community to rethink these terms. In recently published guidelines on colon cancer screening, the radiological examination of the colon is being discussed as a potential screening modality. It would certainly be appropriate for the term colography to prevail over colonography when referring to the multimodal, non-invasive radiologic evaluation of the gut, e.g. in the form of CT colography, PET colonography, virtual colonoscopy, etc. This distinction is based on principles of grammar, linguistics and semantics, which guide language and medical terminology in the same way well-defined principles should guide medical practice. Without such principles, there can only be chaos, and we feel chaos should be kept away – whenever possible – from medicine.

References

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