

Helping Medical Students Write: Genre Analysis of Medical Case Reports

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Abstract

This study uses structural move analysis method of English for Specific Purposes (ESP) genre research in order to examine medical case reports published in on-line medical journals. Specific textual aspects deemed important for the investigation have been selected such as biomedical rhetorical features and conventionalized lexis characteristic of this written medical discourse. The study also explains the key differences between the three established genre research traditions. In addition, important pedagogical applications are briefly discussed.

Key words: medical case reports, structural move analysis, genre research

Introduction

While medical research articles have received close attention in genre research (e.g. Li, Ge, 2009; Nwogu, 1997; Skelton, Edwards, 2008), there has not been an extended study of online published medical case reports (hereafter MCRs). Being one of the oldest and most fundamental genres of medical writing (Dib, Kidd, Saltmann, 2008), MCRs have only partially been investigated in diachronic studies focusing on the development of medical writing in general (e.g., Salager-Meyer, Defives, 1998; Taavitsainen, Pahta, 2000). Synchronically, two variant genres – namely case histories and case presentations – have been analyzed from a critical standpoint: the former by literary theorists (e.g., Charon, 1992; Montgomery Hunter, 1992) and the latter by a medical sociologist (Anspach, 1988).

This study offers additional insights into the characteristic features of written medical discourse by analyzing the overall structure and distinctive linguistic conventions of the genre of on-line MCRs.

Method of Analysis

The present study draws on and contributes to genre research and methodology, as developed by the three genre research traditions: English for Specific Purposes (Swales, 1990; Bhatia, 1993), New Rhetoric (Bawarshi, Reiff, 2010) and Systemic-Functional Linguistics (Halliday, Hasan, 1989). See table 1 below for a summary of the key distinctive characteristics of the three genre movements. However, the present study employs the main analytical method of the English for Specific Purposes (ESP) orientation – namely structural move analysis.

Structural move analysis was first introduced by Swales (1990, 2004) and further elaborated on by Bhatia (1993) and Biber, Connor and Upton (2007). By dividing texts into general organizational patterns, Swales (ibid.) demonstrated that the texts contained recurring functional units which together contribute to the overall communicative purpose of the genre. The outcome of his analysis was a three-move schema for article introductions known as the *Create a Research Space (CARS)* model.

Table 1: Main genre research traditions and their distinctive characteristics (Bawarshi, Reiff, 2010; Hyon, 1996)

	English for Specific Purposes	Systemic-Functional Linguistics	New Rhetoric
Context	<ul style="list-style-type: none"> · L2 – ESL/EFL · tertiary education (EAP classes) 	<ul style="list-style-type: none"> · L1 and L2 (ESL) · primary, secondary, and immigrant adult education 	<ul style="list-style-type: none"> · L1 · tertiary education, disciplines and professions
Methods of Analysis	<ul style="list-style-type: none"> · structural move analysis (with moves consisting of specific steps) · description of discourse communities · corpus-based studies 	<ul style="list-style-type: none"> · register analysis of features of social context (field, tenor, and mode) that shape language forms · generic structure potential 	<ul style="list-style-type: none"> · ethnographic methods: participant observation, interviews, document collection, etc. · methods allowing thick descriptions of context
Genre Definition	<ul style="list-style-type: none"> · communicative event · consistency of communicative purposes · similarity in structure, style, content and intended audience 	<ul style="list-style-type: none"> · staged, goal-oriented social process · structural form that cultures use in certain contexts to achieve various purposes 	<ul style="list-style-type: none"> · typification of social and rhetorical action · stabilized enough site of social/ideological action · fluidity and dynamics of contexts and genres
Emphasis on	<ul style="list-style-type: none"> · linguistic conventions · organizational, stylistic and grammatical features 	<ul style="list-style-type: none"> · relationship between language and functions in social settings 	<ul style="list-style-type: none"> · social purposes that genres fulfil within situational contexts
Genres Analyzed	<ul style="list-style-type: none"> · research articles across disciplines (and their specific parts), university lectures, dissertations, business letters, fundraising letters, etc. 	<ul style="list-style-type: none"> · factual writing – school genres such as reports, procedures, expositions, discussions, recounts, explanations and narratives 	<ul style="list-style-type: none"> · genre sets and genre systems in scientific communities, tax accounting firms, banks, university under/graduate courses, etc
Genre-Based Pedagogy	<ul style="list-style-type: none"> · helping students control linguistic conventions of various genres · flow chart analyses of genre structure, gap filling of structural slots, concordances, etc. 	<ul style="list-style-type: none"> · detailed explicit genre teaching methodology: teaching and learning cycle – context, modelling, negotiation, construction · LERN, AMES/AMEP 	<ul style="list-style-type: none"> · tacit acquisition of genre knowledge · distributed learning · activity theory · focus on the process of writing · WAC/WID/ECAC
Goals	<ul style="list-style-type: none"> · guides and templates for academic writing · helping students become successful writers of formal academic texts 	<ul style="list-style-type: none"> · student empowerment · helping students in participating effectively in the school curriculum and the broader community 	<ul style="list-style-type: none"> · student awareness of social action · focus on unpacking complex relations between text and context
Major Criticism	<ul style="list-style-type: none"> · too prescriptivist · uncritical acceptance of current academic genres · no teaching methodology 	<ul style="list-style-type: none"> · explicit genre teaching · prescriptivism · exclusion of nonmainstream genres 	<ul style="list-style-type: none"> · inconceivability of explicit genre teaching · uncritical acceptance of professional genres
Main Journals	<ul style="list-style-type: none"> · <i>English for Specific Purposes</i> · <i>Text</i> · <i>Journal of English for Academic Purposes</i> 	<ul style="list-style-type: none"> · <i>Australian Review of Applied Linguistics</i> · <i>Annual Review of Applied Linguistics</i> · <i>Linguistics and Education</i> 	<ul style="list-style-type: none"> · <i>Written Communication</i> · <i>College Composition and Communication</i> · <i>Quarterly Journal of Speech</i>

Medical Case Reports as Genre

The MCR can be defined as a medical recount of a pathological condition in a single patient. Authors of MCRs are frequently clinicians who notice unusual, interesting, or unique aspects of their patient's disease, treatment or adverse reaction to the treatment. Multiple case reports of patients with similar conditions are usually referred to as the medical case series.

MCRs have for a long time been regarded as inferior to the genre of medical research articles, which are frequently based on randomized clinical trials. As MCRs are mainly concerned with documenting the development of a pathological condition and its treatment in a single patient, they are often perceived by the medical community as being of relatively weak scientific evidence. On the other hand, there are certain important features of MCRs that make them stand out. One of them is the presentation of valuable information (e.g., comorbidities, patients' histories, doctors' reasoning in determining diagnoses) which is frequently lost in medical research articles reporting results from clinical trials. In addition, from a pedagogical point of view, MCRs offer an excellent opportunity for novice members of the medical discourse community to publish reports of rare cases from their medical practice.

Recently, there has been a growing criticism of medical research which regards randomized clinical trials as the only valid basis of medicine (Greenhalgh 2001:53). This criticism has been expressed by "a vocal pressure group within the medical profession calling for the reinstatement of the humble case report as a useful and valid contribution to medical science" (ibid.).

Historical Importance of Medical Case Reports

MCRs persist as the oldest and most canonical form of medical writing. The genre dates back to Ancient Egypt (1600 B.C.), where medical accounts of individual patients with oncological conditions were written on papyrus. These papyrus records can be considered to be the first medical reports of cancer of the breast (Dib, Kidd, Saltman, 2008). Other important MCRs describing the first cases of now well-known diseases were, for instance, those of melanoma recounted in writing by Hippocrates in the 5th century B.C. or scurvy reported as early as 1500 B.C. in the Ebers papyrus (Wang, Still, 2007). Examples of more recent significant MCRs include those of Hodgkin's lymphoma described for the first time by Thomas Hodgkin to the Medical-Chirurgical Society of London in January 1832 (Dib, Kidd, Saltman, 2008) or a crucial MCR written by Denborough et al and published in 1962, which solved the mystery of malignant hyperthermia (an extremely high fever) and its etiology (Moore, 2007). Smith (2008) summarizes succinctly the role that MCRs have played in medicine: "By definition every new condition – whether it is AIDS, SARS, or the next emergent disease – begins with a single case. ... (C)ase reports can provide definitive not just indicative evidence."

Data

Collected data for the present study comprise a corpus of 40 current MCRs (published between 2007 and 2010) – 20 from the *Cases Journal* (CJ) and 20 from the *Journal of Medical Case Reports* (JMCR). The main criteria adopted for the selection of the samples were:

- peer-reviewed medical journals with open-access online publishing
- author's country of origin being an English-speaking country
- temporal, geographical, and disciplinary representativeness

Both journals offer open-access, peer-reviewed online medical case reports, which can be freely downloaded from their websites⁶. Authors of the selected MCRs come from the following English-speaking countries⁷: UK (16), USA (13), Australia (5), New Zealand (2), Canada (2) and Ireland (2). As for the numbers of MCRs selected per each year, see table 2.

Table 2: Number of MCRs selected per each year/journal

year	2007	2008	2009	2010	total
JMCR	4	6	6	4	20
CJ	0 ⁸	7	10	3	20
total	4	13	16	7	40

The clinical disciplines⁹ represented in the corpus of 40 MCRs are surgery (6), orthopedics (5), oncology (4), general medicine (3), infectious diseases (2), respiratory medicine (2), emergency medicine (2), paediatrics (2), rheumatology (1), urology (1), gastroenterology (1), neurology (1), ophthalmology (1), anaesthesiology (1), cardiology (1), internal medicine (1), hepatology (1), nephrology (1), endocrinology (1), intensive care (1), radiology (1), and psychiatry (1).

For the purpose of analyzing the above described corpus of 40 MCRs, concordance software *TextSTAT 2.5*¹⁰ was used. *TextSTAT* is a text analysis tool which generates lists of word frequencies and concordances from either text files or directly from the Internet. The corpus on which the present study is based has been created from plain text files.

Move Analysis of Medical Case Reports

The following 13 moves have been identified in the corpus of 40 MCRs, based on Swalesian (2004) *CARS (Create a Research Space)* model, Hoey's (2001) basic problem-solution pattern, Nwogu's (1997) move analysis of medical research papers, careful reading of the corpus material and the use of *TextSTAT* concordance software (see the appendix for a move analysis applied to a specific MCR):

I. Introduction Sections

Move 1: ESTABLISHING A TERRITORY via contextualizing the report by providing background information in the form of definitions and descriptions of the pathological condition or diagnostic/investigative/operative procedure

Move 2: ESTABLISHING A NICHE via indicating a gap in clinical knowledge and the relevance of the report by invoking its uniqueness and a lack or absence of reporting

Move 3: PRESENTING THE PRESENT WORK via announcing the present work (optional)

II. Case Presentation Sections

⁶ <http://medicalcasereports.com/> and <http://www.casesjournal.com/content>

⁷ The number of authors from a specific country is given in brackets.

⁸ *Cases Journal* started to be published in 2008, hence no case reports from 2007.

⁹ The number of reports from a specific discipline is given in brackets.

¹⁰ *TextSTAT 2.5* can be downloaded from <http://neon.niederlandistik.fu-berlin.de/en/textstatt/>

Move 4: PRESENTING A PROBLEM via providing a clinical identification of the patient by specifying the patient's demographics and history

Move 5: INVESTIGATING THE PROBLEM via summarizing the patient's diagnostic data from significant examination findings and/or results of investigative procedures, and determining the diagnosis.

Move 6: ADDRESSING THE PROBLEM via describing actions taken to treat the patient by recapitulating any surgical or pharmaceutical interventions.

Move 7: EVALUATING THE OUTCOME via stating the success or failure of the patient's treatment, having resulted either in the patient's survival and cure or death.

III. Discussion Sections

Move 8: PRESENTING BACKGROUND INFORMATION via describing (a specific aspect of) the reported pathological condition, complication, special procedure, or treatment and citing studies which aid in presenting this information

Move 9: REVIEWING LITERATURE PERTINENT TO THE CASE via contrasting and comparing present and previous reports of similar cases or case series (or stating a lack or absence thereof)

Move 10: REFERRING TO THE CASE via invoking relevant features of the reported case in relation to the drawn implications

Move 11: DRAWING IMPLICATIONS via suggesting possible clinical, pedagogic, or research implications and recommendations; and indicating limitations, cautions or unanswered questions

IV. Conclusion Sections (optional)

Move 12: SUMMARIZING THE CASE via recapitulating the central features of the medical case

Move 13: SUMMARIZING IMPLICATIONS via discussing the most important implications and recommendations

Due to the limited space of this paper, only the most important features of each section of the MCR will be discussed.

Ad I) The main function of the introduction sections of MCRs is to set the scene for the subsequent presentation of the case. This is done especially by Moves 1 and 2. While the former contextualizes the report by providing background information, the latter is realized through indicating a gap in clinical knowledge and invoking uniqueness of the case and/or a lack or absence of its reporting. Characteristic lexis used in Move 1 typically involves, inter alia, the following expressions: *common*, *frequently reported*, and *widely used* as in "The *most common* sites of gastrointestinal involvement are the stomach and colon." (CJ 2/1/3). On the other hand, Move 2 contains words such as *unique*, *rare*, and *uncommon* as in "SS is a *rare* condition, with less than 100 cases described." (CJ 1/1/348). Move 3 is an optional move, occurring in 61,54% of all MCRs in the corpus. Self-mention is the most distinctive feature of this move as in "We report a case of 'missed' ureteric obstruction in a type II diabetic..." (CJ 1/1/192).

Ad II) One of the most characteristic features of the case presentation section is its structure according to the problem-solution pattern (Hoey, 2001), which tends to proceed as suggested in table 3. As can be seen from the table, negative evaluation is repeated until positive evaluation and result – in the form of final diagnosis – are achieved.

Table 3: Problem-solution pattern in the case presentation section (CJ 2/1/7176)

Problem-solution pattern	The case presentation section of a given MCR
Situation (optional)	A 30-year-old otherwise fit and healthy white British male was referred to our clinic by his general practitioner with
Aspect of Situation Requiring a Response (i.e. Problem)	an ingrowing toenail of his right hallux from which he had suffered since childhood.
Response	Examination of the foot revealed
Negative Evaluation	no evidence of infection or cellulitis. The hallux nail was in-growing on both its edges, and there was firm granulation tissue palpable at the lateral nail fold. The adjacent interphalangeal joint was normal to examination.
Response	A radiograph of the foot revealed
Negative Evaluation	no evidence of osteomyelitis.
Response	The patient underwent a total excision of the toe nail. At operation a small bony cutaneous lump underlying the nail bed was excised in toto and sent for histopathological examination. This revealed
Positive Evaluation and Result	a well circumscribed dermal nodule of mature lamellar bone containing marrow spaces, which represents osteoma cutis (Figure 1). At four week follow up the nail bed was healing well and there was no evidence of any residual cutaneous lesions.

The case presentation section contains the most prototypical rhetorical features, which have become an established convention of MCRs. In Move 4, the patient is described as *male/female, British/Hispanic, Caucasian/Asian/black, obese* with a certain age (*a 40-year-old man*). These pre-defined abstract categories, into which each patient is classified, are used by physicians so as to render the patient in biomedical terms. The data can then be used for statistical purposes such as the occurrence of a certain disease among people from a specific age group, ethnic background, or occupational sphere. Some other conventionalized collocations include *family history, medical history, the patient was admitted / referred to, positive / negative for* etc. Another type of conventionalization is the use of factive (e.g., note, observe, or find) and non-factive (e.g., deny or state) predicators. Predicators relating to physicians tend to be factive¹¹, presenting the information in the case report as objective and truthful, with the passive voice contributing to an even greater objectivity, as in “It *was found* that the patient had a locally perforated splenic flexure tumour...” (JMCR 3/1/9). Conversely, verbs used with patients tend to be non-factive¹², reducing the patient’s statements to a mere account, which is to be taken with reservations, as in “She *denied* recent weight loss.” (JMCR 1/1/160). Here, the physician leaves open the possibility that she might or might not have lost some weight.

¹¹ According to Crystal (1992, p. 175), the term factive verb refers to “a verb which takes a complement clause, and where the speaker presupposes the truth of the proposition expressed in that clause”.

¹² Non-factive verbs – also called “account markers” by Anspach (1988, p. 17) – “do not commit the speaker to the truth of the proposition expressed in the complement clause” (Crystal *ibid.*).

The most interesting conventionalized linguistic features occurring in Move 5 refer to the presentation of the results from various diagnostic and investigative procedures and tests (such as erythrocyte sedimentation rate [ESR], electrocardiograph [ECG], computerized tomography [CT], or magnetic resonance imaging [MRI]). Frequently, only their abbreviations are used as it is presumed that they are well-known among the readers of the MCRs. In the case presentation sections of MCRs, these procedures and tests are always expressed as agents although they are performed by medical specialists. As Fleischman (2003, p. 479) puts it: "... not only do the writers fail to mention the person(s) who performed the diagnostic procedures, but they also omit mention of the often complex processes by which angiograms and CT scans are interpreted. In treating medical technology as if it were the agent, such formulations support a view of knowledge in which instruments rather than people create the 'data.'" Verbs such as *reveal*, *show*, *confirm*, or *demonstrate* are typically used as predicates to the medical technology as in "Computed tomography (CT) *showed* distended loops of the small intestine." (JMCR 2/1/388).

Move 6 contains a multitude of instances of the agentless passive voice, which contributes to the already depersonalized style of the case presentation sections. The medical professionals behind the actions taken to treat and cure the patient are completely left out of the report. The following example is a demonstration of the overabundance of the agentless passive voice in the case presentation sections (especially in Move 6, but the passive voice tends to appear throughout the section): "... the patient *was taken* to theatre for... A posterolateral thoracotomy *was performed* and the abscess collection *was evacuated*. A small perforation of the diaphragm *was also found* and it *was established* that..." (JMCR 3/1/9).

Move 7 tends to include either a positive or negative evaluation. In the former, expressions such as *good clinical response*, *made a full recovery* or *no evidence of (pathology)* are used. The latter, negative evaluation, contains phrases denoting failure of the treatment: e.g., *symptoms returned*, *failed to improve* or *died*. Instances of both evaluations are the following: "Patient was seen in follow-up *doing well* and *without complaints*." (CJ 1/1/432); "Despite eventual clearance of her fungemia, the patient *died* from multi-organ failure in June 2005." (JMCR 3/1/7611).

Ad III) The discussion section seems to resemble the introduction section of the MCR in that it also includes the presentation of background information and a much more detailed literature review than in the introduction. The literature review occurs in both Moves 8 and 9, but has slightly different functions. While in Move 8 it helps to support the background information (as in Move 1), in Move 9 it invokes similar cases to the one described in the report or emphasizes the lack or absence of any related cases in the literature, thus emphasizing the rarity, novelty or uniqueness of the reported case. Compare the following examples: "Bisphosphonates are the cornerstones of treatment for steroid-induced osteoporosis. [3]." (CJ 2/1/7034) – situating the case report in a particular research context, trend or tradition; "McCune and O'Brien reported the induction of atrial fibrillation (AF) in a previously-well 35-year-old man [6]." (JMCR 4/1/76) – referring to other similar cases.

The most important move in this section is obviously Move 11, which fulfils the section's main function, i.e. speculation. Speculation is frequently expressed via the use of hedging devices such as modal verbs (especially *may / might* and *can / could*) as in "This *may* suggest a hormonal predisposition to the condition." (CJ 1/1/54). Often, the move also contains advice or recommendation typically using the modal verb *should* as in "Renal function *should* be assessed before general anaesthesia." (CJ 2/1/7593). Sometimes, implications of the case report are explicitly stated via the

use of verbs such as *propose*, *speculate*, *hypothesize* or *exercise caution* indicating limitations of the report, cautions and unanswered questions, as in “We *speculate* this was a result of tricuspid valve obstruction from the thrombus...” (JMCR 3/1/8582).

Ad IV) As only 30 out of 40 MCRs contained explicitly labelled conclusions (75%), this section is not an integral part of the genre. Moreover, there were approximately four sentences per conclusion, making it the lowest number of sentences per section. Probably the most characteristic feature of this section, when included in the MCR, is the reiteration of the uniqueness or novelty of the case, using lexis such as *novel*, *unique*, or *unusual*, as in “This case has illustrated an *unusual* presentation of a *rare* condition...” (JMCR 1/1/184)

Conclusion

Although MCRs have been regarded somewhat inferior to the medical research paper based on clinical trials, the genre of MCRs is experiencing a renaissance thanks to the birth of journals such as the *Journal of Medical Case Reports* and several others, which focus exclusively on publishing original MCRs. In addition, MCRs offer a significant opportunity for novice members of the medical discourse community to publish reports of interesting cases. Unlike medical research papers, MCRs tend to be shorter and relatively less complex. However, this does not mean that they evade scientific precision.

As has been demonstrated, the language of MCRs is highly conventionalized, consisting of collocational phrases not to be found anywhere else in written medical discourse. The language of medicine in general and MCRs in particular has been criticized for several reasons including: (1) a tendency to objectify the voice of the medical technology which is placed in the subject position in the sentence (such as *CT scan demonstrated*), (2) an absence of the agency behind the medical procedures performed on the patient (such as *biopsy was carried out*), and (3) a propensity to subjectify patient’s accounts of their pathological conditions (such as *patient denied illicit drug use*).

Typically, MCRs contain 11 moves if without conclusion sections or 13 moves when conclusions are included in the reports. The moves tend to be recycled several times when necessary (e.g., Move 1 or 2) while some moves are not used at all (such as Move 3 or Move 12 and 13).

The most distinctive feature of the genre consists in its emphasis on the rarity, uniqueness, novelty or uncommonness of the reported case, which is accentuated especially in the introduction section of the report in Move 3. This appears to be the reason for establishing a niche, a gap that is to be filled by the report.

The case presentation section differs from the other sections in that it does not follow the established moves for medical research papers suggested by Nwogu (1997). Instead, the structure of the section is based on Hoey’s (2001) problem-solution pattern, beginning with the presentation of the problem, proceeding with its investigation and addressing, and ending with its evaluation.

Pedagogically, structural move analysis of MCRs enables students to practice composing the genre according to the conventions established by the medical discourse community. There are several possibilities how the analysis could be incorporated into the teaching of medical writing at universities. The most basic activity would involve giving students published MCRs in which they would identify the above suggested moves. Alternatively, the teacher would indicate the moves in a

specific MCR without providing their descriptions and students would try to think of the overall function of the moves.

A more advanced approach would incorporate concordance software (such as *TextSTAT 2.5*) into the teaching of writing. By creating their own corpora through collecting online case reports (or any other text-types) and uploading them into the concordance software tool, students can immediately see the most frequent collocations used in the genre. They can search the corpus for clarification of the usage and terminology in the given genre. In addition, the corpus can help students with fine-tuning any grammatical ambiguities such as the use of definite, indefinite or zero articles.

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Cited Medical Case Reports from the Corpus

CJ 1/1/54	http://www.casesjournal.com/content/1/1/54
CJ 1/1/192	http://www.casesjournal.com/content/1/1/192
CJ 1/1/348	http://www.casesjournal.com/content/1/1/348
CJ 1/1/432	http://www.casesjournal.com/content/1/1/432
CJ 2/1/3	http://www.casesjournal.com/content/2/1/3
CJ 2/1/7034	http://www.casesjournal.com/content/2/1/7034
CJ 2/1/7176	http://www.casesjournal.com/content/2/1/7176
CJ 2/1/7593	http://www.casesjournal.com/content/2/1/7593
JMCR 1/1/160	http://www.jmedicalcasereports.com/content/1/1/160
JMCR 1/1/184	http://www.jmedicalcasereports.com/content/1/1/184
JMCR 2/1/388	http://www.jmedicalcasereports.com/content/2/1/388
JMCR 3/1/9	http://www.jmedicalcasereports.com/content/3/1/9
JMCR 3/1/7611	http://www.jmedicalcasereports.com/content/3/1/7611
JMCR 3/1/8582	http://www.jmedicalcasereports.com/content/3/1/8582
JMCR 4/1/76	http://www.jmedicalcasereports.com/content/4/1/76

Appendix – Structural analysis of a short MCR (CJ 2/1/7176) with highlighted lexis.

Introduction Section

MOVE 2	ESTABLISHING A NICHE	Osteoma cutis is an excessively rare lesion which may be either primary or secondary to neoplastic or inflammatory conditions [1].
MOVE 1	ESTABLISHING A TERRITORY	Primary lesions are defined as such in the absence of a preceding skin lesion. Secondary lesions are more common and are associated with scar tissue, acne vulgaris, melanocytic naevi, and basal cell carcinoma. Osteoma cutis may occur at any age and in either sex and has been reported on the hands [2],
MOVE 2	ESTABLISHING A NICHE	but there are few reported cases of foot lesions [3].
MOVE 1	ESTABLISHING A TERRITORY	It has been found to simulate verruca plantaris [4] as well as heel pain [3], but lesions are far more frequently reported on the head and neck of white female patients. There are a number of syndromes associated with osteoma cutis, such as Albright's osteodystrophy [5], fibrodysplasia ossificans and progressive osseous heteroplasia. The stimulus for osteoma formation is unknown.

Case Presentation Section

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MOVE 4	PRESENTING A PROBLEM	A 30-year-old otherwise fit and healthy white British male was referred to our clinic by his general practitioner with an ingrowing toenail of his right hallux from which he had suffered since childhood.
MOVE 5	INVESTIGATING THE PROBLEM	Examination of the foot revealed no evidence of infection or cellulitis. The hallux nail was in-growing on both its edges, and there was firm granulation tissue palpable at the lateral nail fold. The adjacent interphalangeal joint was normal to examination . A radiograph of the foot revealed no evidence of osteomyelitis.
MOVE 6	ADDRESSING THE PROBLEM	The patient underwent a total excision of the toe nail. At operation a small bony cutaneous lump underlying the nail bed was excised in toto and sent for histopathological examination . This revealed a well circumscribed dermal nodule of mature lamellar bone containing marrow spaces, which represents osteoma cutis (Figure 1).
MOVE 7	EVALUATING THE OUTCOME	At four week follow up the nail bed was healing well and there was no evidence of any residual cutaneous lesions.

Discussion Section

MOVE 8	PRESENTING BACKGROUND INFORMATION	The incidence of in-growing toenail in the UK is estimated to be 10,000 new cases per year [6] . In patients in whom it causes symptoms, it is often excised and the nail bed cleared, however non operative management of in-growing toenail is an accepted modality of management . When the nail punctures the skin, granulation tissue is produced at the nail margin.
MOVE 11	DRAWING IMPLICATIONS	What appears to be a primary ingrowing toe nail could sometimes be secondary to other causes such as
MOVE 9	REVIEWING LITERATURE PERTINENT TO THE CASE	soft tissue chondroma [7] osteochondroma [8] , extraskeletal osteosarcoma [9] as well as osteoma cutis;
MOVE 10	REFERRING TO THE CASE	the latter which is rare is highlighted by this case report .

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