Gardner's syndrome: a clinical and genetic study of a family

Maria Giulia Cristofaro, MD, Amerigo Giudice, MD, Massimiliano Amantea, MD, Umberto Riccelli, MD, and Mario Giudice, MD

Objective. Gardner syndrome (GS) is an autosomal dominant genetic disorder with almost complete penetrance (80%) and variable expression. GS is a variant of familial adenomatous polyposis and characterized by extracolonic manifestations including osteomas and soft tissue tumors (desmoid tumors, epidermoid cysts). We describe clinical and surgical approaches in a family in which the genetic disorder was diagnosed in 3 generations.
Study Design. The studied family underwent clinical history and instrumental and genomic studies. Two members of this family, affected with GS, underwent surgery for skeletal osteomas.
Results. The patients that we treated with clinical-instrumental monitoring for a period of 5 years had no major disturbances of the stomatognathic system and no clinical signs of pathology of the gastrointestinal tract, eyes, or endocrine systems.
Conclusions. The orofacial complex disorders are exclusively functional and esthetic, concerning primarily the stomatognathic system. We had no cases of malignant transformation of osteomatosis lesions. Clinical sequelae are manly facial eumorphy and occlusion problems of the temporomandibular joint. (Oral Surg Oral Med Oral Pathol Oral Radiol 2013; 115:e1-e6)

Gardner syndrome (GS) is an autosomal dominant genetic disorder with almost complete penetrance (80%) and variable expression. GS (OMIM 175100) represents a variant of familial adenomatous polyposis (FAP), characterized by intestinal polyps (mainly colon and rectum) having a potential malignant transformation of 100%, especially in patients ranging from 20 to 40 years old.[1] In 1951, Gardner described manifestation of PAF beyond the colorectum[2] and with Richard 2 years later reported the association of hereditary colonic polyposis and osteomatosis with multiple cutaneous and subcutaneous tumors, describing the so-called Gardner syndrome.[1,3]

Dukes was the first to suggest that cancers of the colon and rectum arise from adenomas,[4] a hypothesis later confirmed by Jackson and Mayo in 1951.[5] In 1962, Gardner also reported in these patients dental abnormalities such as agenesis, inclusions, supernumerary teeth, root anomalies (fusion of the roots of the first and second molars), hypercementosis, odontogenic cysts, and multiple caries.[6,7] These abnormalities are present in 70% of affected individuals. Among other extracolonic manifestations, pigmented lesions of the fundus and congenital hypertrophy of the retinal pigment epithelium (CHRPE) are present in >80% of patients[8]; this occurs shortly after birth, being the first clinical signs of GS. The use of CHRPE as a diagnostic marker in patients with high risk has many difficulties owing to differences in familial predisposition to CHRPE.[9-12] Other cancers are strongly associated with GS, such as papillary thyroid carcinoma (especially in female patients), central nervous system tumors such as glioma and medulloblastoma, and cancer of the periampullary duodenum. Adenocarcinoma, adenoma, hepatocellular carcinoma, osteosarcoma, and chondrosarcoma also have been reported.

We present herein a clinical study of a family in which the genetic disorder was diagnosed in 3 generations with variable expression (Figure 1).

MATERIALS AND METHODS

In February 2005, the patient S.G., 46 years old, arrived on our unit with the presence of a swelling in the chin bone region, which had expanded the cortex with displacement of the incisors.

Family anamnesis of the patient reported that his father died at the age of 45 years from colon adenocarcinoma and that he had many more osteomas in skeletal segments, his mother, alive, underwent mastectomy for cancer, and a sister died at the age of 49 years from adenocarcinoma of the colon and presented 2 lesions of the jaw bone.

By his medical history we learned that the patient had already undergone the following:

- January 1980 he had a left mandibular osteoma removed.
- June 2000 he had a frontal bone osteoma removed.
- March 2003 he underwent total ileal colectomy + pouch packaging for colon polyposis and subsequent closure in May 2003 for the ileostomy.

Department of Oral and Maxillofacial Surgery, University Magna Graecia, Catanzaro, Italy.
Received for publication Jul 31, 2011; returned for revision Sep 29, 2011; accepted for publication Oct 4, 2011.

2212-4403/$ - see front matter
doi:10.1016/j.oooo.2011.10.020

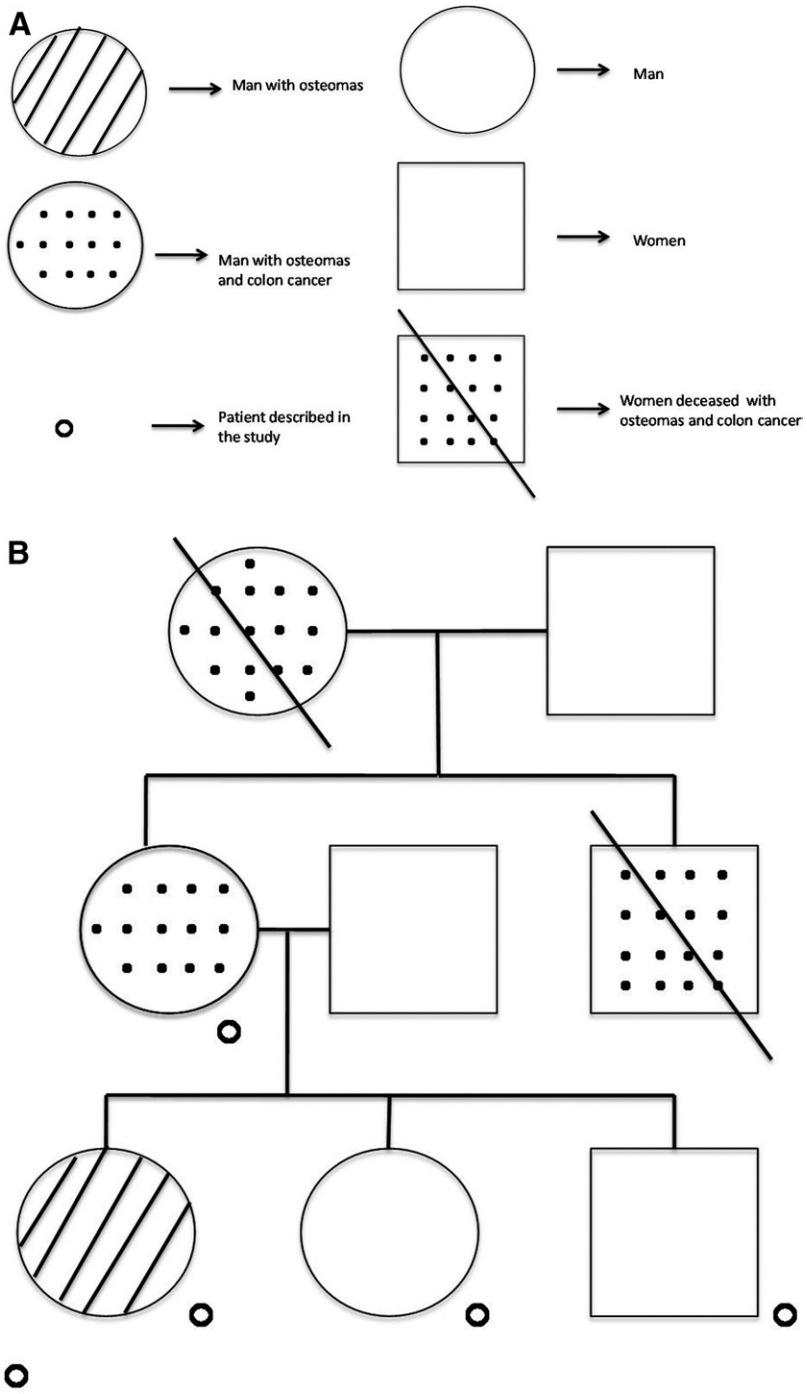

Fig. 1. (A and B) The family tree showing known affected members.

On examination we found face asymmetry due to the presence of different swellings of hard consistency of the mandibular body, bilateral symphysis, and left condylar region.

On intraoral examination, we found alteration of the buccal vestibule lower profile, partial edentulousness, grade 3 (high) mobility of the lower incisors, root residues, and persistence in the arch of deciduous elements (63 and 75). Orthopantomography (OPT) showed the presence of bone thickness areas, rounded wide osteolytic area with clearcut borders, ~3 cm at from the symphysis, which had expanded the cortex, and displaced osteolysis with the later multiple dental inclusions (13, 15, 18, 23, 33-35, 43-45, and 48; Figure 2). A computerized tomographic (CT) scan was per-